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ELEVENTH BIENNIAL REPORT

OF THE

NORTH CAROLINA

BOARD OF HEALTH

1905-1906

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ELEVENTH BIENNIAL REPORT

OF THE

NORTH CAROLINA

BOARD OF HEALTH

1905-1906

RALEIGH

E. M. UZZELL & CO., STATE PRINTERS AND BINDERS

1907

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ELECTED BY THE MEDICAL SOCIETY OF THE STATE OF NORTH CAROLINA.

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Term expires May, 1907.	
HENRY W. LEWIS, M. D.....	Jackson.
Term expires May, 1907.	
THOMAS E. ANDERSON, M. D.....	Statesville.
Term expires May, 1911.	
GEORGE G. THOMAS, M. D., President.....	Wilmington.
Term expires May, 1911.	

APPOINTED BY THE GOVERNOR.

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Term expires May, 1907.	
RICHARD H. LEWIS, M. D., Secretary and Treasurer....	Raleigh.
Term expires May, 1907.	
J. L. LUDLOW, C. E., Engineer.....	Winston-Salem.
Term expires May, 1909.	
W. O. SPENCER, M. D.....	Winston-Salem.
Term expires May, 1911.	
J. HOWELL WAY, M. D.....	Waynesville.
Term expires May, 1911.	

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Alexander	Dr. O. L. Hollar.
Alleghany	Dr. B. E. Reeves.
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Lenoir	Dr. C. L. Pridgen.
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McDowell	Dr. B. L. Ashworth.
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Madison	Dr. W. J. Weaver.
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Union	Dr. Henry D. Stewart.
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LETTER OF TRANSMISSION.

NORTH CAROLINA BOARD OF HEALTH,

OFFICE OF THE SECRETARY,

RALEIGH, April 1, 1907.

His Excellency, ROBERT B. GLENN,

Governor of North Carolina.

SIR:—I have the honor to present herewith the Eleventh
Biennial Report of the North Carolina Board of Health.

Most respectfully yours,

RICHARD H. LEWIS, M. D.,

Secretary and Treasurer.

ELEVENTH BIENNIAL REPORT
OF THE
NORTH CAROLINA BOARD OF HEALTH.
1905-1906.

Since our last report the sanitary history of the State has been for the most part uneventful, we are happy to say. There has occurred no serious epidemic of any kind, and the mortality of our people has been attributable to the common, every-day diseases that are always with us. Owing to the fact that our population is largely a rural one, which renders impracticable the collection of vital statistics from the whole State, it is impossible to make an accurate comparison of the mortality of one biennial period with that of another. There is reason to believe, however, that the work of the Board has borne fruit and that a material advance has been made on sanitary lines. This has been most noticeable in the work for the prevention of tuberculosis, in the installation of public water supplies and sewerage systems, in an increased use of the Laboratory of Hygiene, and in the establishment by the decision of the Supreme Court in *Durham v. Eno Cotton Mills*, under the act to protect water supplies, of the principle that no stream used for drinking purposes can be polluted with raw sewage by any person or corporation.

MEETINGS OF THE BOARD.

MINUTES OF THE ANNUAL MEETING AT GREENSBORO.

GREENSBORO, N. C., May 23, 1905.

Annual meeting of the Board. Present: Drs. Battle, Ivey, Lewis, H. W., Nicholson, Spencer, Way and Whitehead. Mr. Ludlow and the Secretary.

Dr. Whitehead was elected President *pro tempore*.

At their request, Messrs. Webb, secretary and treasurer, and Arbuckle, superintendent, respectively, of the Eno Cotton Mills at Hillsboro, appeared before the Board in relation to the matter of the purification of the sewage from the mills, as required by the act to protect water supplies, complaint having been made by the Durham Water Company of the emptying of the same into the Eno River in its raw state. They proposed a plan of purification by combining the exhaust steam and water of condensation with the sewage. This plan did not meet with the approval of the Board, however. After a thorough discussion of the septic-tank and contact-bed method of purification and of the septic tank alone, it was decided that, while the septic tank alone cannot be depended upon for a complete purification, yet, in consideration of the local conditions and environments, on motion of Mr. Ludlow, it was held that for the present sufficient purification would be accomplished by means of a proper septic tank having a capacity of not less than eighteen hours' flow from the mills, the same to be constructed after design to be approved by the Engineer of the Board.

Application was made by the Biologist, Dr. McCarthy, for an increase of salary on the part of the Board to \$1,000 per annum, beginning with January 1, 1905. On motion of Dr. Nicholson, this was granted.

On motion of Dr. Ivey, the Secretary was authorized, after conference with the Biologist, to employ such assistance in the laboratory as may be necessary and the funds may justify.

The Secretary was instructed to notify the manager of the new knitting-mill building at Hillsboro of the law in regard to sewage purification, and to transmit to the same a copy of the act to protect water supplies.

Drs. H. W. Lewis and Ivey, who were appointed a committee to audit the report of the Treasurer, reported it correct.

On motion, the Board adjourned to meet again in the conjoint session with the State Medical Society at 12 M. to-morrow.

RICHARD H. LEWIS,
Secretary.

GREENSBORO, N. C., May 24, 1905.

Notification of the election of Drs. George G. Thomas and Thomas E. Anderson by the House of Delegates of the Medical Society having been made at the conjoint session, a meeting of the Board as thus newly constituted in part was called and Dr. Thomas was re-elected President.

Rev. Dr. McKelway appeared before the Board and asked to be heard on the subject of child labor. Time not permitting the reading of a paper he had prepared on the subject, it was, on motion, ordered published in the Monthly Bulletin.

On motion the Board adjourned. RICHARD H. LEWIS,
Secretary.

NOTE.

Subsequent to the meeting of the Board a difference of opinion arose between the Biologist and the Secretary-Treasurer of the Board as to the proper disposition of the fees received for extra analyses and examinations not required by the law to be made free of charge. The Biologist contended that the work was done outside of laboratory hours, and that therefore the fees belonged to him personally. The Secretary-Treasurer took the position that this would be, in his opinion, an unwise arrangement and that it would be better, if necessary, to pay the Biologist a higher salary. The Biologist then agreed that if he were paid \$100 per month by the Board he would be willing to resign all special fees. In order to avoid the expense of a special meeting to settle the matter, the question was submitted by the Secretary-Treasurer to all the members of the Board by letter, with the request that they would give their views as to its proper settlement in their replies. The result of this epistolary vote was that the Biologist should be paid as that part of his remuneration coming from the Board a flat salary of \$100 per month beginning with January 1, 1905, making, with that paid by the Board of Agriculture, an annual salary of \$1,950, and that all money received for work in the laboratory from every source should be covered into the treasury of the laboratory.

PROCEEDINGS OF THE ANNUAL CONJOINT SESSION
OF THE
MEDICAL SOCIETY OF THE STATE OF NORTH CAROLINA
AND THE
NORTH CAROLINA STATE BOARD OF HEALTH,
HELD ON WEDNESDAY, MAY 24, 1905,
AT GREENSBORO, N. C.

At 12 M. on Wednesday, the second day's session of the Medical Society, in conformity to the usual annual custom, a recess of the Society was, on motion, ordered for the purpose of holding a conjoint session with the State Board of Health.

The great majority of the members of the Society remained in attendance.

The conjoint session was called to order by Dr. S. Westray Battle, of the Board, who expressed the pleasure of the Board in seeing the session so well attended.

The annual report of the Secretary was called for, and presented by the Secretary, Dr. R. H. Lewis, as follows:

REPORT OF THE SECRETARY, MAY 1, 1904. TO MAY 1, 1905.

During the past year the special work of your Secretary—in addition to the usual routine work of the office, which is always to the fore, and a statement of which in detail will be found in the biennial report for 1903-'04—has consisted in promoting the crusade against tuberculosis inaugurated in our last report. The suggestions therein made have been carried out as fully as our very limited facilities—half the time of one stenographer—have permitted. The plan pursued has been as follows:

First, the preparation of a pamphlet on the "Causes and Prevention of Consumption." The attempt was made to put the matter to the people as simply and clearly as possible and at the same time to make it as interesting as the narrow limits demanded by the necessary conciseness would permit. As a copy of this publication has been sent to you it is superfluous to further dwell upon it.

The question of getting the pamphlet into the hands of the people was carefully considered, and it was decided that it would be much

better to send it directly to the individual instead of depending upon the "take one" principle. In a population as large as ours a selection of the individuals had to be made, of course, and the following classes, which were regarded as the most influential in this work, were selected to be served first: Editors, physicians, ministers, lawyers, teachers, and manufacturers employing in-door labor.

Realizing that literature that is not read is usually so much waste paper, it was thought that if a short letter printed in typewriter type, with the signature of the Secretary in script, was enclosed with the pamphlet, it might excite interest, to some extent, at least. So a letter to each of the classes named above was specially composed to suit, earnestly appealing to them to read it and assist in spreading the information contained in the pamphlet, and promising in every case to send, free of charge, as many copies as the reader would agree to distribute. The editors of our State were exceedingly kind in noticing the article in their papers, and in consequence there have been calls for it from Indiana to Texas. Ministers and teachers have shown the most interest and have agreed to do more distributing than any of the others. While by far the most important of all in the solution of this great problem is our own profession, they have, I deeply regret to say, apparently felt no concern about it. I say apparently, because they may and in very many cases no doubt have exerted themselves to instruct their tuberculosis patients and the members of their households in the proper methods of prevention. For humanity's sake, and for the honor of the profession, let us hope and believe so at any rate. It was hoped that there would be a large demand from them for the pamphlet for distribution among their tuberculous families, but that hope, much to my disappointment, not to say mortification, has proven an "iridescent dream" so far. But we will not despair. We cannot abandon the hope of securing the earnest and interested co-operation in this great work, which means more for suffering humanity than any other that can be mentioned, and which is receiving at this time so much attention and sympathetic aid from so many persons of all callings who love their fellow-men all over this great country of ours and throughout the civilized world, from the one class who can do so much to advance it.

The county medical societies could be of much service in this campaign against tuberculosis. I hope they will devote at least one meeting every year to it, having some one read a paper and then holding a symposium on the subject. As we know, the curability of tuberculosis depends most of all upon an early diagnosis—before the degenerative changes have begun—and a thorough discussion of this one aspect of the subject would doubtless eventuate in much good. The chief benefit to be derived, however, would consist in an increased interest in the subject and a keener appreciation of the grave responsibility of the physician in relation to it, whether he

wishes to admit it or not. This might suggest to some the advisability of personally, as well as professionally, aiding in the various forms of effort—in helping towards the formation of anti-tuberculosis societies and by giving an occasional lecture, for example.

As this subject has been considered more or less fully in the tenth biennial report, the manuscript of which has been in the hands of the printer for months, I will not further tax your patience with it. Anybody desiring a copy of this report can get it, as soon as it is printed, by sending a request for it to the Secretary.

Smallpox has continued to prevail throughout the State, and more widely than ever before—the number of counties infected is 78. The number of cases is, white 3,636, colored 3,741, total 7,377; number of deaths, white 13, colored 18, total 31. Death rate per cent. for the whites 0.36, for the colored 0.48, for both races combined 0.42. The figures for the last smallpox year were, respectively, cases, 2,840, 2,530, 5,370; death rate, 1.23, 1.34, 1.28; for the year before that—1902-03—1,861, 2,595, 4,456, with a death rate per cent. of 3.12, 4.04, 3.66. From these figures it appears that the disease has been becoming more abundant and decidedly less fatal. As a consequence of this mildness the difficulty in controlling it has become greater than ever. Indeed, it gives some color for reasonableness to the suggestion that has been made to abandon the attempt to control it at all, although, of course, that cannot be seriously considered. There is no telling when it may become very much more fatal. The following is a tabulated statement of the smallpox in the State for the past year. While it shows a larger number of cases than ever, I am sure that a great many cases have never been reported:

SMALLPOX REPORT FROM MAY 1, 1904, TO MAY 1, 1905.

County.	Number of Cases.			Number of Deaths.		
	White.	Colored.	Total.	White.	Colored.	Total.
Alamance	23		23			
Alexander	45		45			
Anson	243	63	306			
Ashe	286	60	346	2	2	4
Beaufort	78	112	190	1	1	2
Bertie		1	1			
Bladen	30	70	100	1		1
Buncombe	31	7	38			
Brunswick	100	200	300	3	6	9
Burke	7		7			
Cabarrus	17	3	20			

SMALLPOX—CONTINUED.

County.	Number of Cases.			Number of Deaths.		
	White.	Colored.	Total.	White.	Colored.	Total.
Caldwell-----	4	13	17			
Camden-----	7	205	212			
Carteret-----	32	2	34			
Catawba-----	5		5			
Chatham-----	3	23	26			
Chowan-----	21	36	57			
Clay-----	8		8			
Cleveland-----	10	40	50			
Craven-----	2	43	45		2	2
Cumberland-----	8	6	14			
Currituck-----		10	10			
Davidson-----	2	3	5			
Davie-----	21	7	28	1		1
Duplin-----	1	53	54			
Durham-----	11	34	45			
Edgecombe-----	18	40	58			
Forsyth-----	35	15	50			
Franklin-----	14	6	20			
Gaston-----	30	18	48			
Gates-----	40		40			
Granville-----	25		25			
Greene-----	75	225	300			
Guilford-----	21	62	83			
Harnett-----	28	36	64			
Haywood-----	38		38	1		1
Henderson-----	86	7	93			
Hertford-----	5	122	127			
Hyde-----		4	4			
Iredell-----		8	8			
Jackson-----	100		100			
Johnston-----	4	5	9			
Lenoir-----	57	51	108		1	1
Macon-----	2		2			
Madison-----	6		6			
Mecklenburg-----	27	7	34			

SMALLPOX—CONTINUED.

County.	Number of Cases.			Number of Deaths.		
	White.	Colored.	Total.	White.	Colored.	Total.
Mitchell -----	6		6			
Moore -----	24	4	28	1		1
Nash -----	17	63	80			
New Hanover -----	39	165	204			
Northampton -----	26	15	41			
Onslow -----	126		126	1		1
Orange -----	1		1			
Pamlico -----	191		191			
Pasquotank -----	5	18	23			
Pender -----	5	8	13			
Perquimans -----		32	32			
Person -----	25	7	32			
Pitt -----	100	50	150		1	1
Randolph -----	35		35			
Richmond -----	25	40	65			
Robeson -----	40	30	70			
Rockingham -----	12	8	20			
Rowan -----	4	1	5			
Rutherford -----	1	9	10			
Sampson -----	12	90	102			
Scotland -----	1,000	1,350	2,350		2	2
Stanly -----	10	1	11		3	3
Swain -----	9		9			
Transylvania -----	39		39			
Wake -----	177	47	224			
Washington -----		2	2			
Warren -----		4	4			
Wayne -----	30	100	130			
Wilkes -----	34	96	130			
Wilson -----	11	2	13			
Yancey -----	23		26		1	1
Total in 78 counties -----	3,636	3,739	7,375	13	18	31
Death rate, per cent. -----				0.36	0.48	0.42

The laboratory has continued to be of much assistance in our sanitary work—more than for any preceding year—but at the same time it must be confessed that our physicians do not use it as they ought. The report of the Biologist is appended.

In the way of sanitary legislation we have secured the passage by the last Legislature of an act to establish a State Laboratory of Hygiene, but failed to get an appropriation large enough to justify cutting loose from the Agricultural Department. The ice, however, has been broken and we hope to get sufficient money at the next session of the General Assembly to put us on an independent basis. We can then offer still greater facilities to the profession, although it must be confessed that they do not take advantage of what we have been offering as we believe they should.

In conclusion, I wish to bespeak the cordial co-operation and assistance of our brethren of the profession in our work. While we may accomplish something without this, their aid and help would be simply invaluable.

THE PRESIDENT: We have some papers on the programme of the conjoint session. They are now in order. Dr. E. C. Levy, of Richmond, will favor us with a paper on "Relative Value of the Various Methods of Determining the Sanitary Qualities of a Water Supply."

RELATIVE VALUE OF THE VARIOUS METHODS OF DETERMINING THE SANITARY QUALITY OF A WATER SUPPLY.

By ERNEST C. LEVY, M. D., Richmond, Va.

It is only within comparatively recent years that the importance of pure water has come to be fully recognized. Up to that time little more was asked of any source of supply than that it could be relied upon to furnish an abundant quantity of water pleasing in appearance and agreeable to taste.

In the dawn of the new era, when men began to realize that a water possessing the above elementary requirements might still be unwholesome and even dangerous for drinking purposes, the aid of a chemist was called to settle the question. During this period things were expected of the chemist which we of to-day know he was unable to accomplish. It was then common practice to send him a bottle of water, with no data as to its source or surrounding conditions, and expect him, as a result of his laboratory investigation, to give a final and absolute opinion.

With the advent of bacteriology, hopes were for a brief time entertained that an infallible means had been found for determining the

sanitary quality of any water with unerring accuracy. The really harmful factor in a polluted water being the bacteria of disease which might be present, the detection of these, it was argued, would be the final proof of the unfitness of a given water, while in their absence a water could be considered at least not dangerous. But it was soon found that, however well established the relation between certain bacteria and the disease to which they give rise, and however easy their identification in pure culture, yet the detection of these bacteria in water was a task never easy and usually impossible. Thus, because bacteriology stood self-confessed as unable to accomplish the supreme test demanded of it, the real possibilities of the science were either overlooked or undervalued, and for a time, indeed until quite recently, chemical methods again enjoyed the ascendancy, though now decidedly shorn of almost superstitious reverence previously accorded them.

Along about this time it began to be recognized that the subject of water sanitation was one of sufficient importance to constitute a real specialty in itself, and so, while most chemists and bacteriologists were engaged in the futile and rather amusing attempt to claim superiority for their respective sciences, a few, with wider vision, began to attack the problem in the true modern spirit—by work instead of words—and as a result of their labors, both directly and in the impetus thus given to the whole subject, the modern water expert came into being. The object of the present paper is to show the necessity of bringing to bear all the available methods of research in arriving at a trustworthy opinion of the sanitary quality of a water supply. This can, of course, be done merely in outline in a paper of this kind.

As above suggested, the work of a water expert is not the simple matter it was formerly held to be. True, in many instances a given water is so obviously and grossly contaminated that its unfitness for drinking purposes is manifest to even the most casual observer. Such cases need not be discussed here. At the other extreme stand those woodland springs and streams (each year becoming more rare), so removed from all possible contamination as to be unquestionably pure. But the vast majority of all possible sources of water supply (excluding those so plainly contaminated as to be unworthy of consideration) fall in the class where prudence suggests or demands an investigation of their sanitary quality.

The opinion is still widely prevalent, not only among the general public, but among members of the medical profession as well, that a chemical examination of water for sanitary purposes is much the same thing as an analysis for any other purpose; such, for instance, as the determination of the commercial value of an iron ore or the purity of a food product. Such is by no means the case. In a sanitary water analysis the analytic processes themselves are for the

most part as satisfactory as in the instances above cited, but with the iron ore or food product the interpretation is evident when once the analysis has been made, while the water analysis merely furnishes data to assist the judgment in arriving at an opinion. This is a necessary state of affairs, arising from the fact that, in a water contaminated by an ordinary sewage, chemistry does not detect the presence of any substances injurious in themselves, or even any substances actually characteristic of sewage, but merely gives evidence of the presence of such things as, however harmless in themselves, have been found to be associated with polluted water. Thus, were one to give to a chemist a sample of water to which had been added a few spoonfuls of moderately salted broth, the analysis would be pretty much the same, even before the broth had undergone any change, as if an even larger amount of sewage were present; yet the broth is, of course, harmless, while the sewage might contain myriads of typhoid or other disease germs.

In spite of their limitations, the importance of chemical analyses must by no means be underestimated; but, except in cases of marked pollution, they can seldom be relied upon themselves for furnishing adequate information. Their greatest field of usefulness, perhaps, is in affording a measure of the degree of pollution where this is very great, rather than in giving evidence in more doubtful cases.

In one direction, at least, chemistry is able to do what can be accomplished by no other means, namely, to afford evidence of the fact that a spring or well water comes from a polluted source, even when complete removal of the contained bacteria and oxidation of the organic matter originally present in the water has been accomplished. In this way it can direct attention to the possibility of future danger through interference with the soil filtration by which purification is taking place at the time of the examination.

Bacteriological methods, like the chemical, fail as a rule to show the presence of the actual things which make a water unwholesome or dangerous, but they accomplish a much nearer approach to this end. The real danger in a polluted water lies in the presence of bacteria of disease, and especially, so far as our present knowledge goes, in the presence of bacteria derived from individuals suffering from certain diseases in which the germs gain entrance to the body by the mouth and leave it, enormously increased in numbers, from the other end of the digestive tract. Bacteriological methods are able to determine, with a high degree of accuracy, the presence of organisms characteristic of sewage, and since a water supply which is shown to contain sewage must be liable at any time to contain dangerous micro-organisms (in case any of the individuals contributing this regular sewage should be suffering from any of the water-borne diseases), such water is very properly held to be dangerous.

Not only can bacteriological methods determine the presence of sewage contamination with greater directness than can be done by chemistry, but they can detect its presence when the dilution is so great that chemical methods fail utterly. In distinction to what has been said of the ability of chemical examination to throw light on past pollution and to predict, at times, the danger of serious conditions in the future, the revelations of bacteriology are confined strictly to conditions existing at the time of the examination.

Besides the chemical and bacteriological examinations, we are able to gain valuable information in some cases by means of the physical and direct microscopical examinations, which last afford a means of ascertaining the character of the suspended matter present, including organisms other than bacteria. These two methods, while having their own field of usefulness, are not of as great value in this special connection as those previously mentioned.

In determining the sanitary quality of a water supply, we have, in addition to the laboratory methods above mentioned, two other methods of the utmost value: (1) a study of the vital statistics of the community supplied by the water in question, and (2) a sanitary study of the watershed in the case of streams and of the more immediate environment in the case of wells and springs.

The information to be gained by studying the vital statistics is, of course, available only in connection with the water supply already in use. In certain instances the information secured by this means is more positive than that obtained by any of the above methods, but this study must be conducted with the greatest care, avoiding the many pitfalls always in wait for the unwary.

Regarding the sanitary study of the watershed, it is right here that a mistake is frequently made. While it is universally acknowledged that only the chemist and bacteriologist can carry out the methods of these special sciences, it is by no means uncommon to regard the ability to draw correct deductions from a sanitary study of the watershed as independent of such training. As a matter of fact, the ability to give their proper value to the various features present and to sum up intelligently the influence of all the factors involved comes only from long experience. Even then cases will arise in which the water expert must draw upon his judgment rather than upon any precedent, either in his own experience or that of others.

A careful investigation of all possible factors of contamination must be entered into. The relation of the volume of the stream to the amount of the polluting material, the distance of the source or sources of pollution from the intake of the water supply, the time taken by the stream in flowing between the points in question under both normal and flood conditions, are among the most important considerations where a running stream is concerned. In this connection

it may be mentioned that modern scientific opinion tends more and more to the view that, in the present built-up condition of our country, very few streams indeed furnish a water entirely satisfactory from a sanitary standpoint without the adoption of some means of artificial purification. In the case of springs or wells the points to be observed are different, and usually relate to rather immediate environment, except in cases of deep (real or so-called artesian) wells, the waters of which may come from greater distances. The geological structure of the region must always be given consideration. In a recent case of the writer's the fact that certain shallow wells were in rocks of igneous origin led to the expression of an opinion quite different from what would have been given had they been in sandy or gravelly soil.

From what has been said it must be evident that forming an opinion as to the sanitary quality of a given water is a thing demanding more than a mere chemical and bacteriological examination. Both of these are necessary, but in addition to this there are a great many other things to be done. Even so far as the analyses themselves are concerned, the real test of skill is in the ability to put a correct interpretation on the analyses after they are made. The analytic data themselves may aptly be compared to the symptoms which enable the physician to make his diagnosis, and every member of this Society knows the skill demanded in this connection, and how, at times, some apparently trivial symptom, which one of less experience might entirely overlook, may lead the skilled diagnostician to his final judgment of the true condition.

The study of the surroundings should never be neglected. To do so would be much the same as for a physician to be contented with making his diagnosis and deciding on his line of treatment after making a laboratory examination of the urine, sputum and blood without even having seen his patient, or having even learned anything of his past history or present symptoms. At times this might be possible, but generally it is a thing few would care to attempt. Of course, it is possible in many instances to have a division of the labor between a skilled observer in the field and the chemist and bacteriologist in the laboratory, in the same manner as the laboratory worker and the attending physician may co-operate.

The writer wishes, in conclusion, to urge upon the members of the medical profession the importance of becoming acquainted with the work which has been done in recent years in connection with water sanitation. While such a degree of familiarity with the subject as can be acquired by the busy practitioner will not, of course, make him an expert in this line, it will still enable him to do an immense amount of good in calling attention intelligently to some of the more palpable transgressions against the laws of health, which are now reaping their regular harvest of illness and death.

DISCUSSION.

Dr. W. J. MARTIN: Mr. President, if you will pardon me, I would like to say a word about this very interesting paper, because I have myself been interested in it and paid some attention to it. There are two things which I want to say correlative of this paper: One is in regard to the way samples are sent for water analyses. The average person sending you in a sample for examination will put it in an old jug with an old stopper, or in an old bottle, and put absolutely no mark on it, and send it along and request you to tell them whether it is fit for drinking or not, and whether it can be condemned or not. I have had others to do it under the direction of the physicians, thinking that the chemist, like a magician, can put his wand in the bottle and draw forth a conclusion in regard to the water. Now, chemistry cannot bear that. The chemist, in order to make his report fairly, honestly and intelligently, must have before him all the facts of the case, and there are no facts more important to him in forming his opinion of the water than those facts which are gotten by the survey of the field of the source of the water. He must know the history of this water, so far as it can be known and intelligently given. If not, it is not fair to expect him to give a proper diagnosis of the water condition. I wish you would burn that into your memories, into your consciousness and into the memory and consciousness of your patients—those whom you are concerned about. Whenever you send to a chemical laboratory a sample of water for examination, do you, as the scientific expert of your community, see to it that a minute history of that water goes along with it, and throw any light that can be thrown on the subject, and, before you send it, write to the expert as to how you send it and how you collect the sample. I have heard people say, "If I am going to tell you all about the water, I don't want you to tell me about it." You may think that is casting a slur upon the chemist's ability, but all of our abilities are limited, and with that knowledge we can give you much better service, and what we want is the service.

There is another question, Mr. President, that was not directly touched upon there, and in which I have been very much interested of late. This gives me a chance to say something about it.

I suppose that a vast majority of the cases of contamination of water are sewage contamination. By sewage contamination we do not necessarily mean the sewage contamination of cities, but of local conditions. Our sewage is deposited somewhere around the neighborhood of the well or the spring, and it gets into that well or spring after a time. I have heard men say that their father or grandfather was raised off that water, and they don't believe me when I say that this well is not pure and wholesome. They fail to remember that the ground, like a sponge, not only takes up water, but holds microbes. And the sewage is deposited there and works deeper and further year by year, until finally—it may be after decades—years have passed, the contamination does reach the well, and disease results. Now, it becomes important that we should recognize that as soon as possible, and, while the presence of chlorine does not necessarily mean that the water has been contaminated with sewage, with the knowledge before us of local conditions and the normal chlorine content of the water of that location, it will tell us a great deal. If I know the local chlorine content of water, and I find in another water that persistently and continuously for a length of time the chlorine is in excess of the normal in that location, it is a mighty strong indication to me, supplemented by connection with other parts of the examination, that that water has been contaminated by sewage. Now, there are cases on record in your own family in which the ice-cream freezer has been dumped out near the well, and if, twenty-four hours after that, you had examined that water, you would have found an increase of chlorine in the water. But where, day after day and month after month, the chlorine content is higher than the normal for that locality, you may suspect trouble. That simply leads me to this: If we had a knowledge of the normal chlorine content of waters of the different points of the State, it would put in the hands of even the physician a very powerful means of making a rapid examination of the water with reference to a supposed contamination in his own neighborhood. Now, I believe (you can probably tell me if I am mistaken) that for our country only two States have done that. Massachusetts and Connecticut have established well-defined chlorine curbs throughout the State. I believe it would pay if means were raised whereby well water,

spring water, lake water, surface water—all kinds of water—could be sent in from every locality of the State to the laboratory and an examination be made from time to time throughout different parts of the year, until finally we could establish a *chlorine map* that would give us, to a great extent, the chlorine content of the waters throughout the State, and then we would be able, with a very simple examination—one that you could make almost at any time, especially through a range of a week or a month—whether there was any probable contamination of the water. I think that it is a thing that the Medical Society could very well take up, which the Board of Health could push—this matter of obtaining a chlorine map of the State.

Dr. Joseph Graham, of Raleigh, was then requested to read his paper on "A Proper Milk Supply for the Cities and Towns of North Carolina," but he requested that he be allowed, as everybody was tired, to postpone his paper until after dinner, which was allowed.

Dr. Ivey then asked to be informed whether that meant that the conjoint session adjourn for another year, or for them to have the paper in the Medical Society. The President suggested that the Medical Society should take it up in the regular session immediately after dinner.

On motion, it was so ordered, if found agreeable to the President of the Society.

A very interesting talk was made on "Effects of Child Labor" by Dr. A. J. McKelway, of Charlotte.

The conjoint session then adjourned *sine die*.

The State Board of Health held a short session, at which the Secretary announced the appointment by Governor R. B. Glenn of Drs. J. Howell Way and W. O. Spencer, and the election by the Society of Drs. George G. Thomas and Thomas E. Anderson members for the ensuing term of six years.

On request of the President, the members of the Board of Health remained, and a short executive session of the Board was held.

PHYSICAL EVILS OF CHILD LABOR.

By A. J. MCKELWAY, Assistant Secretary National Child Labor Committee.

When the health and vitality of a large number of our own people are concerned, to whom shall we go save to the physician, whose ministry it is to usher life into the world, to save it and to prolong it, and to whom, therefore, life itself should be a more sacred thing than to the ordinary man? When I think of our little children of the Southern States with their splendid physical inheritance, and how much it costs to bear them and rear them and train them, it does seem a pity that this stock should be depreciated by putting the child to work for the man's long working day.

The evil is a national and not a sectional evil. But because of its newness in the South we have been the last to remedy it by legislation, and the proportion of child to adult workers is four times as large in the South as in the Northern and Western States. The physiological question is, whether children under fourteen years should be allowed to work in a factory for twelve hours a day; especially whether young girls between the ages of twelve and fourteen, in this climate should be allowed to do the spinning and weaving that falls to them, at this critical period of their lives, during the twelve-hour working day, which is the rule in North Carolina and the cotton-manufacturing States of the South; whether children of either sex under fourteen should be allowed to work during the night.

It may be of interest to you to know that the first public protest made against this evil, which has been the curse of the cotton mills especially for a hundred and fifty years, was made by physicians. Dr. Thomas Percival, author of "Medical Ethics," made an investigation of the causes of an epidemic of fever in the Manchester cotton-mill districts, which had been accompanied by frightful mortality among the children. Dr. Percival and his associates were unable to ascertain how the fever originated, but they were unanimous in their opinion that it had been "supported, diffused and aggravated by the injury done to young persons through confinement and too long-continued labor, to which evils the cotton mills have given occasion." And they passed the following recommendations to the Manchester magistrates:

"We earnestly recommend a longer recess at noon and a more early dismissal in the evenings to all those who work in the cotton mills; that we deem this indulgence essential to the present health and future capacity for labor to those who are under the age of fourteen, for the active recreations of childhood and youth are necessary to the right conformation of the human body."

This was in 1784. In 1786 Dr. Percival and his associates in the medical profession had formed themselves into the Manchester Board of Health. They felt it incumbent to lay before the public the result of their inquiries into the condition of the cotton mills of Manchester. They said: "It appears that the children and others who work in large cotton factories are peculiarly disposed to be affected with the contagion of fever." And among the causes of this they found one to be, "the want of active exercise which nature points out as essential to childhood and youth to invigorate the system and to fit our species for the employments and the duties of manhood." They went on to say: "The untimely labor of the night and the protracted labor of the day, with respect to children, not only tends to diminish future expectations as to the general sum of life and industry by impairing the strength and destroying the vital stamina of the rising generation, but it too often gives encouragement to idleness, extravagance and profligacy in the parents, who, contrary to the order of nature, subsist by the oppression of their offspring."

It would have been well if England had followed the advice of her physicians at once instead of fighting over the question inch by inch for a hundred years, for in that time the physical vitality of the factory population has been fatally sapped. This is now known to be the real secret of the disaster of the British army in the South African war.

Dr. Charles W. Roberts, of England, gives the following striking results of the examination of 19,846 boys and men, of whom 5,915 belonged to the non-laboring class and 13,931 to the artisan class. The difference in height, weight and chest girth from thirteen to sixteen years of age, is as follows:

HEIGHT (inches).

Class.	Age.			
	13.	14.	15.	16.
Non-laboring class -----	58.79	61.11	63.47	66.40
Artisan class -----	55.93	57.76	60.58	62.93

WEIGHT (pounds).

Non-laboring class -----	88.60	99.21	110.42	128.34
Artisan class -----	78.27	84.61	96.79	108.70

CHEST GIRTH (inches).

Non-laboring class -----	28.41	29.65	30.70	33.08
Artisan class -----	25.24	26.28	27.51	28.97

And among the artisans the people of the cotton mills stand lowest in the physical scale.

Commenting on these figures, Dr. W. W. Keen, of Philadelphia, says:

"Constant standing and superintending a loom, or other similar work requiring constant standing, itself stunts the growth of children at these plastic ages. The ages in question, thirteen to sixteen years, are precisely the ages when, under favorable circumstances, these children develop physically with great rapidity. This is especially true of girls. To confine these children in mills, with lack of opportunity for schooling, is to prevent both the physical and mental development of such children to a degree which is most injurious, not only to them, but also to the community—that is to say, the State.

"In my clinics for the past forty years I have had many hundreds of such children, under-developed in mind and body, ill-fitted to enjoy life themselves or to transmit vigorous minds and healthy bodies to their children."

The same process which Mr. Chamberlain is trying to counteract in England by a protective tax on the products of the farm, thus sending the people back to the country from the overcrowded factory districts, is being repeated on a tremendous scale in the South and in North Carolina. From one little village, called Clyde's, near Waynesville, during the past year fifteen hundred of our splendidly developed mountain people have gone to the cotton mills of South Carolina. They have been tempted from the farm by the prospect of getting wages from every member of the family, from eight to ten years up. There is just now unprecedented demand in the factories for labor, and the demand is being met by the employment of children on a larger scale than ever before. It is a conservative estimate to say that there are fifteen thousand children under fourteen years of age working in the cotton mills of North Carolina twelve hours a day or night, and the greater part of these are girls, the future mothers of the race. "It is a shame for a nation to make its young girls weary."

Is it not time for such protest to be made by the physicians of North Carolina against the extension of this evil as was made by the physicians of old England more than a hundred years ago? The science of medicine has advanced almost infinitely since that day. But the fundamental facts regarding childhood and its rights remain unchanged with the centuries.

A PROPER MILK SUPPLY FOR THE CITIES AND TOWNS OF NORTH CAROLINA.

By JOSEPH GRAHAM, M. D., Raleigh, N. C.

Next to bread and water, milk is more commonly used than any other article of food or drink.

In cities and towns almost every home receives daily a supply of milk and cream. This is used at every meal and, with few exceptions, by every member of the household. It is an article of food in which every one may be said to be interested. Milk is a nutritious, economical, and with many a favorite food. It is a very cheap food, as it contains more nutritive matter than can be obtained at the same cost in other foods.

Milk is generally used in the raw state. Most other foods are cooked before they are eaten, and most, if not all, the bacteria they contain are killed by the heat.

We have no simple means by which we can definitely determine the purity of milk. The quality of most foods can be judged by their appearance. This is not the case with milk. There is no article of food which can be adulterated or contaminated, without changing its appearance, to such an extent as milk. The fact that milk appears perfectly sweet is not a proof of its purity, for if the germs are already in it the harmful change may take place after it enters the stomach. Then, too, some disease-producing germs do not cause souring of the milk, and therefore their presence is not detected.

Impure milk may cause serious and even fatal diseases. Frequently cow's milk is the only nourishment taken by infants and invalids, and it is these who are least able to stand the ill effects of impure foods. Every year more children have to be nourished with substitutes for mother's milk. Usually cow's milk is selected, and, when pure, there is no superior food for this purpose.

About one-third of all deaths are of infants, and a very large percentage of these die from diseases of the digestive tract. These diseases are mainly due to impure food. It is, therefore, reasonable to assert that the mortality of infants has a close relationship to the wholesomeness of the milk supply.

Milk is the most suitable culture medium we possess for the growth of germs. These germs grow and elaborate poisons both before and after taken into the infantile stomach.

The agency of milk in the spread of contagious diseases has only lately been appreciated. Outbreaks of disease have been definitely traced to infected milk. Among the most common diseases carried in this way are typhoid fever, diphtheria and scarlet fever. There is little doubt that tuberculosis is also spread in the same way. In 1900, Kobor collected records of 330 epidemics which were spread by

milk. These illustrate very well how the milk most frequently becomes infected. There were 195 outbreaks of typhoid fever, 99 of scarlet fever, and 36 of diphtheria. In the typhoid epidemics the disease prevailed at the dairy in 148 instances; in 67 the milk was diluted with infected well water; in 34 cases the employees acted as nurses, and in 10 they continued to work for a while, although themselves suffering from the disease. In one instance it was found that the milk cans were washed with cloths used about patients; in two cases the dairy employees were connected with the night-soil service.

Of the 99 epidemics of scarlet fever, there were diseases at the farm or dairy in 68 instances; in the other instances the dairy employees acted as nurses or lodged in infected houses. As it is difficult to procure cow's milk sufficiently free from germs, we have tried to find some safe way to destroy the germs already present. There are two classes of apparatus used to destroy germs: one known as a sterilizer, which sterilizes the milk at a boiling temperature (212 degrees F.), the other, called a pasteurizer, killing germs at a much lower temperature.

There are certain disadvantages in sterilized milk. The taste is very considerably changed; such milk is very much more constipating and more difficult of digestion; also it seems to be less nutritious—certainly children do not thrive as well when fed on sterilized milk as when nourished with pure cow's milk. Pasteurization of the milk produces less change in the constituents of the milk than sterilization, and, as it is sufficiently thorough in the destruction of germs, it has become the most popular method of sterilization.

Sterilization of milk has certain limitations. Heating milk destroys only living organisms; it does not kill spores, nor does it remove toxins or poisons. Before sterilization milk may already contain the products of bacterial growth in such quantity and of such a character as to render it wholly unfit for food. Even though just sterilized, it may still be poisonous to an infant, for sterilization will not kill the products of bacterial growth. It is, therefore, very important that sterilization be done at the earliest possible moment.

We must always remember that sterilized milk is much more difficult of digestion. The only value of sterilization is in the preventing of disease: first, by enabling us to feed infants on milk in which no considerable fermentative changes have occurred; and second, by destroying disease-producing germs with which the milk may have become accidentally contaminated. Milk can never be made pure after it has once been badly contaminated. *These methods are only meant for somewhat improving conditions which should have been prevented.* The expediency of pasteurization as well as sterilization may be considered doubtful. It would be far more desirable to use absolutely natural milk from perfectly healthy cows, and so have it good, pure and safe.

The milk supply of Raleigh, my home town, so far as I have investigated, is unnecessarily impure. This fact I have learned through sad bedside experiences, inspection of the dairies, and by repeated examinations of samples of milk bought in the open market. The attention of the Board of Health was called to this matter and a committee was appointed by the Board of Health to inspect all the dairies and to employ a bacteriologist and chemist to examine samples of milk from all of our dairies. This committee was instructed to devise a plan to correct any evils they might find. The result of the dairy inspections, together with the bacteriological and chemical reports, showed conclusively that the milk supply was unnecessarily impure.

Forty samples of cow's milk were examined by Dr. F. L. Stevens, of the Agricultural and Mechanical College. These examinations showed that the nutritive quality of the milk was very satisfactory.

Twenty-two samples were examined for streptococci. In one instance streptococci were found in considerable numbers. In five other instances streptococci were recorded as being present. Therefore streptococci were found to be present in thirty per cent. of the samples examined.

Of the forty samples examined there was no sample bearing less than 34,000 germs to the cubic centimeter, and only eight samples ran less than 100,000. These eight were all collected on cool days. Seventeen samples out of 39 ran above 1,000,000 germs per cubic centimeter, four samples ran above 4,000,000, and six samples were between 500,000 and 1,000,000.

These numbers are exceedingly high, very much higher than would be expected, or has been found in any city the size of Raleigh in which the milk reached the consumer so soon after milking.

The relation between the number of germs and the amount of dirt in the milk is clearly set forth in the following table, representing the analysis of three samples:

Sample Number.	Dirt, Milli-grams per Litre.	Number Germs per Cubic Centimeter.
1-----	36.8	12,897,600
2-----	20.7	7,079,820
3-----	5.2	3,338,775

The curd test was used in 28 instances and 14 samples were found to be gasey.

The high number of germs found in the Raleigh milk is to be attributed to two causes: first, improper handling of the milk, and uncleanness of the utensils that the milk has come in contact with;

and second, failure to cool out the animal heat immediately after milking, and the improper temperature at which the milk has been kept.

Therefore the committee suggested to the Board of Health that they request the Board of Aldermen to appoint a milk commission to control and regulate the milk supply. This milk commission should consist of five members—the Mayor, Superintendent of Health and three representative citizens. The Board of Aldermen should require each dairyman selling milk in the city to procure a milk license. This license should be revoked if the milk commission advised revocation, for good and sufficient reasons. This milk commission should employ a chemist and bacteriologist to examine samples of milk at least once a month, and to examine the animals for tuberculosis at least once a year. I consider the tuberculin test very important, for recently, in one Raleigh herd of 18 cattle, 6, or 33 $\frac{1}{3}$ per cent., were found to have tuberculosis. *All new cattle should be tested for tuberculosis before they are bought by the dairymen and added to the dairy herds.*

It should be the duty of the dairy inspector to examine the cattle, drainage, ventilation, food, water, yards, pastures, methods of milking and handling the milk, and all the matters connected with the health management and care of the animals. He should see especially to the health of the animals, cleanliness of barns, proper disposal of manure. Also he should see that there is an abundance of pure water, *that the milk is immediately cooled after milking and that there are proper facilities for cleaning and sterilizing all bottles and dairy utensils.*

The Superintendent of Health should examine all persons working about the dairy or in any way connected with the care of the animals, milk, or utensils and the transportation and delivery of milk, in relation to their habits of cleanliness as well as for transmittible diseases.

The bacteriologist should examine the milk to test the efficiency of the methods in force. He should take samples from the consumer, in original packages as delivered by the dairymen, and by bacteriological and microscopical examinations determine the nature of the bacterial contents, and if pus cells are present. His examinations should be made every few weeks, and will be the truest indication of the thoroughness with which the milk commission's requirements are being followed. I think that the bacterial standard of purity should not be adopted until the commission has been working for several months, so as to ascertain *the proper standard.*

The chemical examinations should be made sufficiently often to determine if the milk is of correct composition, of requisite richness and free from adulterations. In our examinations we found the milk of proper fat content and free from chemical adulterations.

It is sincerely hoped that our Board of Aldermen will adopt some such plan. I believe this is the ideal way in which to control and regulate the milk supply. I believe it is practicable and will produce the desired result, and at the same time exert little hardship upon our dairymen.

This plan is not expensive. We estimate that we can operate our milk commission and employ a dairy inspector and a bacteriologist and chemist for \$600 a year. The dairymen will have to bear only a small part of this expense, as they will be charged a very moderate fee for license to sell milk.

For the production of pure milk fine buildings, fine cattle and expensive apparatus are not at all necessary. At least 99 per cent. of the contamination of milk *occurs after the milk leaves the cow*. To prevent such contamination cleanliness and constant care are absolutely necessary.

At present it is impossible in most of the towns of this State to get the health authorities to adopt proper ordinances for the control of the milk supply. The greatest obstacle to municipal control of the milk supply is the fact that *the public does not yet appreciate the absolute necessity for such control and the danger of using impure milk*.

In every community much can be done toward improving at least a portion of the milk supply. Each local medical society can form an agreement with the leading dairymen of the town to furnish milk according to their requirements in return for their endorsement of the purity of their milk.

A certificate, given by the local medical organization and stating that a dairy is conducted in an approved manner, would be very useful to a milk seller by enabling him to secure better prices and new trade, for many of the best class of milk users would value the assurance thus given. When it becomes known throughout a town that a certain dairy has been awarded a certificate on account of the excellence of its methods, its business will immediately increase, and to such an extent that other dairies will soon be pressing for examinations in order that they may secure similar certificates. In order to make the plan still more attractive to the dairymen, it would be well to bring the matter before the public by periodically publishing the list of approved, certificated dairies and making brief but pointed statements of the objects of the system and the way to obtain the endorsement.

Any one, seeing the list, would naturally look for his milkman's name on the list; and, if not found, explanations would be sought. Without doubt many would insist that those supplying them be on the list. In this way the dairyman would receive a better price for his milk and would be enabled to pay the fee of the local milk commission for examining his dairy and product.

The objection may be made that the small dairyman *cannot afford* to conduct his place in the proper way, and that, therefore, the plan proposed is unfair. The answer to this objection is that a small dairy can be conducted in a cleanly way as well as a large one. Those having only a few cows and whose interests are mainly in other lines might not find it profitable, but the necessary improvements need not be out of the reach of farmers with large or even small herds, if they are determined to do the thing right and give it all the necessary attention. There is no good reason why those who wish to progress should be deterred by the fact that all cannot reach the highest standard.

One of the principal advantages of this plan is that it can be easily inaugurated and that those who wish to be helped by it can quickly get the benefits. That numerous class who would oppose the enactment of these regulations into laws (for the reason that they would not care to be governed by them) would have no ground for *valid* objection because of the *voluntary* feature of the plan suggested. No one would be *compelled* to come under the commission and its rules. The second advantage is, that it gives reliable information to consumers as to where to secure the best milk produced, and they are no longer compelled to depend upon *appearances* of the milk or the *statements of the dairyman*.

The marked improvement of a few dairies would have a beneficial effect on the entire supply, and the badly kept dairies would be obliged to improve to keep their trade. The increased receipts from higher prices and enlarged trade should enable the dairymen to pay moderate prices for certificates.

In some cases it might be better for the local medical organization to establish a milk commission upon a philanthropic basis and demonstrate its value, when the dairymen would gladly pay its expenses.

MINUTES OF THE ANNUAL MEETING AT CHARLOTTE.

CHARLOTTE, N. C., May 29, 1906.

The Board met in annual session, with President Thomas in the chair. Present: Drs. Thomas, Ivey, Anderson, Spencer, Way, R. H. Lewis and Mr. Ludlow. A telegram from Dr. Battle, expressing regret that unavoidable circumstances had prevented his attendance, was read.

The minutes of the last meeting were read and approved.

The Secretary called attention to the vote taken by letter during the year, by which the salary of the Biologist in charge of the laboratory was ordered increased from \$83.33 1-3 per month to \$100 per month, with the understanding that all fees received by him for extra analyses not required by the law to be made free of charge should be covered into the treasury of the laboratory. This action by letter was ratified.

On motion of Mr. Ludlow, the Secretary was authorized to expend \$35 per month for the services of a stenographer and clerk.

The Secretary-Treasurer called the attention of the Board to the fact that he had never been required to give bond as Treasurer of the Board or as *ex officio* Treasurer of the State Laboratory of Hygiene, expressed the opinion that as a matter of business he should be made to give a proper bond, and formally requested that it be required of him. Thereupon, on motion of Dr. Spencer, the Treasurer was ordered to execute a bond of \$5,000 in some security and bonding company of good standing, and instructed to pay for the same out of the two funds in his custody, *pro rata*.

Drs. Spencer and Way were appointed a committee to audit the accounts of the Treasurer.

In discussing the subject of desirable health legislation, the advisability of having diphtheria antitoxin made by the State for free distribution to the poor was suggested by Dr. Spencer. While agreeing as to the importance and desirability of such

manufacture, the consensus of opinion was that the time was not ripe for such a movement in our State, and no action was taken.

On motion of Dr. Way, it was

Resolved, That the thanks of the State Board of Health are hereby tendered the State Board of Agriculture for its invaluable aid in conducting sanitary work in its laboratory to the great benefit of the people, and that it is requested to continue this help for another year, at the end of which time it is hoped the laboratory may be able to stand alone.

The following communication from the Mayor of the town of Waynesville was read:

MAYOR'S OFFICE.

WAYNESVILLE, N. C., May 26, 1906.

At a special meeting of the Mayor and Board of Aldermen of the town of Waynesville, held May 26, 1906, at the Mayor's office, the following resolution was unanimously adopted:

"That the State Board of Health be requested to send their Engineer here to examine and report to the proper authorities health conditions in the town of Waynesville, and particularly to examine and report upon the water supply of the town; also that said Engineer report upon watersheds near Waynesville.

"That the Mayor be requested to forward to the State Board of Health a copy of above resolution."

The foregoing is a true copy.

H. R. FERGUSON, *Mayor*.

After careful consideration of the matter, the Engineer of the Board was requested to examine the analyses of the water supply for the past six months and report thereon to the municipal authorities, this report to be supplemented by a letter from the Secretary. It was decided that this is as far as the law requires action.

Dr. R. H. Lewis was elected the delegate to represent the Board at the next annual meeting of the American Public Health Association.

The Auditing Committee reported that they had examined the accounts of the Treasurer and found them correct.

Committees were appointed to inspect the public institutions of the State.

On motion, the Board adjourned to meet to-morrow, at noon, in conjoint session with the State Medical Society.

RICHARD H. LEWIS,

Secretary.

PROCEEDINGS OF THE ANNUAL CONJOINT SESSION
OF THE
MEDICAL SOCIETY OF THE STATE OF NORTH CAROLINA
AND THE
NORTH CAROLINA STATE BOARD OF HEALTH,
HELD AT NOON, WEDNESDAY, MAY 30, 1906.
AT CHARLOTTE, N. C.

At 12 o'clock Dr. Thomas, President of the State Board of Health, called that body to order, in conjoint session with the Society. The following members were present: George G. Thomas, M. D., President, Wilmington; S. Westray Battle, M. D., Asheville; Thomas E. Anderson, M. D., Statesville; W. P. Ivey, M. D., Lenoir; J. Howell Way, M. D., Waynesville; W. O. Spencer, M. D., Winston-Salem; J. L. Ludlow, C. E., Winston-Salem; Richard H. Lewis, M. D., Secretary and Treasurer, Raleigh.

Dr. THOMAS said: Instead of taking up your time with any remarks, I wish to say that there is a movement on foot in North Carolina now for the organization of a society for the prevention of tuberculosis—this being a State organization—and also participation in a national movement to that end.

I deem it unworthy of remark to this body of intelligent men to say that any step taken toward the control of the "Great White Plague" is valuable. The movement which will be offered to you this morning is the beginning of an educational campaign, and, I take it, logically to be carried on by this association throughout the State by its members, whom they hope to enthuse with the zeal it now inspires, and by all manner of means, consistent with the best interests of the people at large, as well as the association, to propagate this movement and bring it to a highly successful end. Dr. Stevens, appointed by your President the chairman of this committee, will be glad to present to you a tentative constitution and by-laws of this association. Dr. Hays, the secretary of this committee, has this constitution, and will be very glad to read it to you. (I am very glad

to say the President put me upon this committee, for which I thank him.) The committee will be very glad, after this is presented, if it appeals to you (and you all are, I think, interested in this subject). We want you to come and join this organization and do whatever lies in your power to further the object which it presents to you.

Constitution read by Dr. Hays. (See index for paper and other data.)

Dr. THOMAS: Now, gentlemen, you have heard this. These gentlemen, Dr. Stevens and Dr. Hays, will give you a card, and from that will take your consent to become a member of this association, and later on they will send you out such literature as is necessary. I will be glad to have the report of the Secretary of the Board of Health.

Dr. R. H. LEWIS, Secretary of the State Board of Health: They want one dollar, I think it is, from each of you to organize this society. This is not a part of the State Board of Health's work, but is merely supplementary to it. I explain by these few words so that you will understand what we are driving at. We want to get a sufficient number of subscribers so that the society can be organized now.

Dr. R. H. LEWIS, Secretary of the Board of Health, read his report:

REPORT OF THE SECRETARY, MAY 20, 1905, TO MAY 20, 1906.

During the past year our State has not suffered from any epidemic of serious nature and our people have enjoyed the health attendant upon normal conditions. It is true that smallpox has continued to prevail in various localities, as we anticipated and predicted, but, as appears from the detailed report given below, it has been less prevalent and even less fatal than usual. Owing to this more pronounced mildness the people, and the authorities in some communities, have been very neglectful of it.

In this connection it is proper to call attention to two incidents in relation to this disease occurring during the past year—both calling forth an opinion of the Attorney-General. In the first case the question raised by the county attorney of Hyde was as to the power of the County Sanitary Committee to order compulsory vaccination. The matter was referred to your Secretary by the County Superintendent for settlement. While in my opinion there was not the slightest doubt as to this power I thought it wisest to have the opinion of our Attorney-General, which would be authoritative. In unequivocal terms he

declared the statute conferring this power upon county sanitary committees to be valid.

In the second case the question was essentially the same, although the occasion of it was somewhat different. The County Sanitary Committee of Washington County, in addition to ordering compulsory vaccination in a certain township infected with smallpox, forbade any teacher to teach or any child to attend school who could not present a certificate of vaccination. This order was resisted by the County Superintendent of Public Instruction, and hence the appeal to me by the County Superintendent of Health. I immediately took the matter up with the State Superintendent of Public Instruction. To be perfectly sure of his ground he obtained a ruling from the Attorney-General. This supporting our position, he at once ordered compliance on the part of his subordinate.

One matter of very great and far-reaching importance, involving a new question in our State, has come up for adjudication since my last report. This is the pollution of streams used for drinking purposes. Section 13 of "An Act to Protect Water Supplies" reads as follows: "No person, firm, corporation or municipality shall flow or discharge sewage into any drain, brook, creek or river from which a public drinking water supply is taken, unless the same shall have been passed through some well-known system of sewage purification approved by the Board of Health. Any person, firm or corporation, or any officer or any municipality having this work in charge, who shall violate this section shall be guilty of a misdemeanor, and the continued flow and discharge of such sewage may be enjoined by any person." The Eno Cotton Mills, at Hillsboro, empties its raw sewage into the Eno River, from which the Durham Water Company obtains a part of its supply lower down the stream. The cotton mills refusing to comply with the requirements of the act, a suit to enjoin them from emptying their raw sewage into the river was brought by the city of Durham. The case was decided in the lower court in favor of the plaintiff, and the defendant cotton mills appealed to the Supreme Court. The case has been argued and a decision will doubtless be handed down before adjournment—in the next few days. That this decision may certify the validity of the act is greatly to be desired. It is a most important matter in its bearing upon the health of our people. People must have water to drink, and they have a right to demand that it be safe water. Owing to the geological formation artesian wells are impossible in a large part of the State, and consequently the water of streams must be used. It is true, also, that people must get rid of their excreta, and the most satisfactory way of doing this is by water carriage through sewers into an adjacent stream. The law does not forbid this, but merely that a community adopting this plan shall, before emptying its sewage into a stream used for drinking purposes by another community below, submit it to such process of purification as may be approved by the State Board of Health. This is a

reasonable requirement, and one which a due regard for the public health demands. From the present outlook it appears that North Carolina is destined to be a great manufacturing State, and many who now hear me will live to see a factory and its accompanying village or town on the banks of nearly every stream within our borders. It is, therefore, extremely important that this question should be settled now, in the beginning, comparatively speaking, of our industrial life, and consequently we await the decision of our court of last resort with anxious solicitude.*

Upon request of the authorities investigation of sewerage problems have been made during the year for the town of Southern Pines and the State Hospital at Morganton and advice given. The reports will be printed in the next biennial report.

Tuberculosis continues, of course, to be our most fatal disease and its prevention the greatest as well as the most difficult problem we have to consider. Owing to the very small amount of money at our command and the other demands upon that, our efforts are, necessarily, greatly circumscribed. The policy outlined in my last report—that of appealing directly to the individual by sending him, through the mail, the pamphlet on the Prevention of Consumption, with an accompanying letter calling attention to it and asking its careful reading—has been pursued during the past year. One hundred thousand copies of this pamphlet have been printed, and over eighty thousand have been distributed to date. Many letters of acknowledgment and appreciation and asking for additional copies, to the number in some instances of 500, have been received, and there is no doubt that interest in the subject has been quickened and much good, it is believed, has been done. As it could be done without materially adding to the postage bill, slips on the prevention of typhoid fever and of malarial fevers have been inserted between the leaves of the pamphlets. In this way at a very trifling cost information in regard to these diseases has been widely disseminated. The most discouraging thing in this campaign of education has been the entire lack of interest and co-operation on the part of our profession. In the very beginning a pamphlet with a letter, earnestly appealing to them for their help in this most important work, was mailed to practically every physician in the State. As they came in contact with nearly every case of tuberculosis in their professional work, it was hoped that they would be glad to supplement their words of instruction to their patients and their exposed families with the pamphlet. But the hope has been unfulfilled, not half a dozen physicians having applied for pamphlets for distribution. Consequently we have received no help from the most powerful and potentially effective agency that could possibly be enlisted in this great work for suffering humanity.

The State Laboratory of Hygiene, while it has done more work than in any preceding year, has not been utilized by the profession to the

* The Supreme Court sustained the validity of the act.

extent one would have expected. The interest is growing, however, and will doubtless continue to increase. As time will not permit the reading in full the report of the Biologist I will give a few short extracts. The total number of samples examined was 1,096, divided as follows: Public water samples from 47 water-works, 591; private and physicians' water samples, 210; pathological samples, 295. Of the last-named about one-fourth were diphtheritic exudates, one-half tuberculosis sputum, and the rest chiefly feces examined for hook worm. An interesting statement by the Biologist, who is a reader of French and German scientific periodicals, is that "The consensus of opinion among working biologists in Europe is that tuberculosis is rarely transmitted directly from cows to humans. This does not mean that there is any radical or specific difference between the germs of human and bovine tuberculosis. It simply means that germs habituated to parasitism on bovines do not easily or at once adapt themselves to the human environment, and as a consequence are less virulent and less able to overcome or counteract the natural protective secretions of the human organism."

Smallpox, as stated in the beginning, has been less prevalent and less fatal than usual. A comparison with last year shows the total number of cases to have been 6,051, against 7,375; and the number of deaths 12, one white and 11 colored, as against 13 and 18 white and colored, respectively, for last year.

The following is a detailed report of smallpox for 1905-'06:

SMALLPOX REPORT, FROM MAY 1, 1905, TO MAY 1, 1906.

Counties.	Number of Cases.			Number of Deaths.		
	White.	Colored.	Total.	White.	Colored.	Total.
Alamance -----	1		1			
Anson -----	5	44	49			
Beaufort -----	38	75	113			
Bertie -----	120	180	300			
Bladen -----	15	14	29			
Brunswick -----	5	30	35			
Buncombe -----	8	2	10			
Burke -----	1	4	5			
Camden -----	3	25	28			
Carteret -----	2	2	4			
Catawba -----		1	1			
Chatham -----	4	12	16			
Cherokee -----	482	4	486			

SMALLPOX—CONTINUED.

Counties.	Number of Cases.			Number of Deaths.		
	White.	Colored.	Total.	White.	Colored.	Total.
Chowan -----	35	77	112			
Clay -----	5		5			
Cleveland -----	6	6	12			
Columbus -----	56	19	75			
Craven -----		10	10			
Cumberland -----	285	30	315			
Currituck -----	37	14	51			
Dare -----	4	4	8			
Davidson -----		2	2			
Davie -----	8		8			
Duplin -----	5		5			
Durham -----	5	1	6			
Edgecombe -----		12	12			
Forsyth -----	2	2	4			
Franklin -----		1	1			
Gates -----	50	150	200			
Granville -----	1		1			
Greene -----	3		3			
Guilford -----	15		15			
Halifax -----	54	4	58			
Harnett -----	50		50			
Henderson -----	11	2	13			
Hertford -----	25	100	125			
*Hyde -----	900	1,100	2,000	1	2	3
Lenoir -----	1		1			
Macon -----	12		12			
Madison -----	13		13			
Martin -----	5	5	10			
Mecklenburg -----	12	24	36			
Montgomery -----	2	4	6			
Moore -----	21	60	81			
Nash -----	16	33	49			
New Hanover -----	33	97	130		2	2
Northampton -----	80	40	120		1	1

SMALLPOX—CONTINUED.

Counties.	Number of Cases.			Number of Deaths.		
	White.	Colored.	Total.	White.	Colored.	Total.
Onslow	1		1			
Pamlico	2	6	8			
Pasquotank	28	67	95			
Pender	50	100	150			
Perquimans	150	400	550		2	2
Person		1	1			
Pitt	1	5	6			
Polk	4		4			
Richmond	2	12	14			
Robeson	50		50			
Rockingham	2		2			
Rowan		2	2			
Sampson	3	10	13			
*Scotland	3	3	6			
*Stanly		2	2			
Union	12	150	162		1	1
Wake	1		1			
Warren	2		2			
Washington	40	120	160		2	2
Wayne	18	180	198		1	1
Total in 67 counties	2,805	3,246	6,051	1	11	12
Death rate, per cent.				0.036	0.34	0.19

*Estimated.

Dr. THOMAS: Gentlemen, the report is before you. What will you do with it? Any discussion?

Dr. LEWIS: Mr. Chairman, I will be very glad indeed to hear from some of the gentlemen present in regard to the pamphlet and its distribution. The trouble may be with the pamphlet. Now, I am a great believer in advice and suggestions from other people. I like to know what other people think; then, of course, I do what I think is right afterwards; but I like to get the wise suggestions from others. I would like to hear from the gentle-

men in regard to the pamphlet—if it is too abstruse, or anything.

Dr. JULIAN: Mr. President, I want to say that I read the pamphlet, and it embraces everything. I am quite sure, for the prevention of tuberculosis that we know to-day, and I don't think there will be any adverse criticism on that pamphlet, and it is what every physician needs. The American Congress have done the same thing; the Anti-Tuberculosis League in Atlanta have done the same thing, and the only reason the thing falls flat is because the physicians neglect to call the attention of the families to it. They are afraid to distribute literature in families where there are supposed cases of tuberculosis. I think we ought to advocate the early diagnosis of tuberculosis—that tuberculosis is not consumption; to show them that it is curable and preventable, and, as it is curable, it surely is preventable; that there is no other way except through enlightenment and through knowledge, and it is the only way, through such pamphlets, that we can educate the physician and the community, and there should not be any adverse criticism on that, and it is only the negligence of the physician in bringing it to the attention of the families; and I think we should, through this Health Board, get our Legislature to require physicians to report all cases of tuberculosis, just as they do diphtheria, smallpox, etc.

Dr. TEMPLETON: I have joined this society* to-day; hence, any remarks will probably be in order. It seems to me it would be well to incorporate in that organization—in the resolution there—that we propose to stamp out and prevent malarial diseases. If it be in order, sir, I move that that be incorporated as one of the duties of that organization.

Dr. ROSE, Superintendent of Health of Cumberland County: Mr. President, as Superintendent of the Health Board of my county, the greatest trouble I have in the county of Cumberland is with the class of people who cannot read that circular—the people that are ignorant and cannot read the circular. The instruction that I give them falls flat, as you say your circular has fallen upon the ears of the society. They forget it as soon as I am out of the house. The great trouble I have with it there is amongst the negroes. Unfortunately, we have a class of negroes that have been migrating to the North in recent years.

* State Anti-Tuberculosis Society.

and I suppose in the last two years there have been probably a hundred cases of tuberculosis that have gone to the North and have contracted consumption and have come home to die; and I know of one instance of one family that I attended some time back—when one son went to the North he came back (there was a family of eight)—and five of them up to this date have died of tuberculosis, contracted from this one case. That is the trouble that I find with the tuberculosis there. We have a great deal of it, of that class of it that is brought back from the North, and in that class of patients the pamphlet falls flat, because they cannot read it and the instruction that I can give them is not of much avail.

I agree with Dr. Julian; there ought to be a law to force the physicians to report tuberculosis, the same as they do smallpox, so the houses can be fumigated.

Now, after the death of a patient, in one or two instances I have had the house fumigated and have had the thing stopped, but I find that year after year they are dying. I know in Fayetteville now two out of one family have tuberculosis, and three out of the same family have died within the past two years.

Dr. MASON, of Charlotte: When the pamphlet was received it may have been that just at the moment the doctor had no case to whom he could give it. It may be in two or three weeks he can give it out, and if he knows where he can conveniently get them he will give them out. If you don't send them to the Secretary of the County Society I would suggest that each secretary be supplied with these, and that the secretary notify the physicians that he has these papers and that at any time they are needed he will be glad to supply them.

In regard to reporting cases of tuberculosis, I think that we would make a mistake if we passed a law that every case be reported, because there are many cases that if we would tell them they had tuberculosis we would sound their death knell; but every case that has progressed to a certain extent should be told, and every house that has had cases of tuberculosis in it should be fumigated—we know that; but I don't think we should be so strict that we should make every man who has tuberculosis aware of that fact. We have to use judgment in the matter, in my opinion. We can't tell every man that he has tuberculosis, has

been my experience; if you do, it has a depressing effect upon him, and we want the opposite effect; we want the patient to believe he is going to get well, and for him to know that he has tuberculosis at this time—when they don't believe they are going to get well—if you tell a man he has tuberculosis he will die. It is a campaign of education, I think, before we pass that law. We want to educate the physician.

Dr. JULIAN: Mr. President, I want to reply to Dr. Mason in this. He says he don't think the time ripe now to report these cases. So long as you are afraid to report your cases of tuberculosis, so long as you are afraid to take care of them, you will have them.

As to reporting them: It isn't consumption until it reaches a certain point. The public can be told that it isn't consumption, and they can be educated to the subject and lives saved. I told the mother of a boy the other night: "Your son has tuberculosis; put him out in the sun." He is now in the open air, and I am sure he will live a long time. He would probably have died next spring. I am sure now that he will live a long time.

Dr. FERGUSON: Mr. President, we know it is a disease of the masses—a disease existing all over the civilized world. Researches of recent years have demonstrated that this disease, under certain conditions, is a disease susceptible of arresting, and, under some conditions, of a cure, and, above all, that it is a preventable disease. The physicians of all the civilized world know this, and are directing their efforts more or less to the consummation of this end; and, whatever principles have been established that will stand the test of time in this matter, one fact is without question, and that is, intelligent co-operation of the masses to the consummation of this end; and if the physicians, the teachers and employers, men and women of talent and inclination in this direction, are united in one purpose, to the attainment of this end, much can be done. The greatest cause, probably, of propagating this disease is general ignorance in the matter of hygienic living. There is one objection, there is one fault, it seems to me, comes from information spread by distribution of literature suitable to this end, and that is its great lack of sticking qualities. In the treatment of tubercular cases that have never been in the sanitarium, have never been required

to live in conformity with any fixed methods of hygienic practices, while they will hear you along this line, it is exceedingly difficult, in my experience, to get them to conform in their daily habits of living to any measure of hygienic practices which is essential to the cure and to the limitation of this disease.

Dr. WEAVER: Mr. President, old Rip Van Winkle has always been noted for his conservatism.

I doubt at this time the feasibility of reporting the tuberculosis cases. I think the pamphlet issued by the Board of Health covers the ground thoroughly. As the gentlemen have aptly said, it is a campaign of education, and I doubt whether the profession is educated up to that point whereby they can reach the laity yet. Tuberculosis is not so infectious as we may have been taught to believe. We should teach the people one thing—the essential thing—and that is the care of the sputum; that it is only dangerous in its dry state; that while it is in its moist state probably it is not very contagious. The laity should be taught how to prevent tuberculosis. They should be taught to take care of the cuspidors, those who are affected with it—to have the contents destroyed by burning.

It is the people in the rural districts that need to be educated; not so much in the towns. You must remember that there is from 90 to 95 per cent. of rural population in North Carolina, and that there are more cases of tuberculosis in proportion to population in the rural than there are in the thickly settled districts—in the cities of over eight thousand inhabitants. And why? Because the people have never been taught the importance of taking care of the sputum; and the laity, visiting a family where there is an infection, probably sit in the doorway and around the hearthstones and spit, and the tubercle bacilli arise in the air and thereby disseminate the disease in half a dozen families.

I have one instance—a sad instance—I might relate, where I was called to see a young lady and she had tuberculosis—no, she had consumption. I warned the family of the danger of it and how to prevent it, but they took no heed of it, and six months later I was called to see her, but she was in a dying condition, and in a few days was dead. A few months after that I was called to see the second member of the family, a daughter, and

she had already passed the stage of tuberculosis and was in consumption. The father was sitting there, and said: "Doctor, I want you to examine me. The doctor that was attending me this spring told me I had an abscess on my lungs." I examined the two patients and they both had incurable consumption. Two months from that time they both were buried the same day, in the same grave—all on account of the family physician not telling them how to take care of their sputum in the first patient.

This is the present idea: "Teach the laity," and we cannot do it better than by the dissemination of the literature, and then the time will come when we can pass these compulsory laws. The time will come when we can have sanitariums over the State for the indigent poor. We have our hospitals for the insane. Why not for the much more afflicted tubercular patients, which, I must say, to our chagrin, amount to more in the State of North Carolina than in the great States of Massachusetts and New York. Their percentage isn't more than 12½ per cent., while North Carolina and her sister State—Tennessee—and the Ohio Valley is 14 per cent. It is astonishing, and should wake up every physician; he should be, as Osler said, "the man behind the gun" to enlighten the people. Only 2 per cent. of the people are treated in the sanitariums of the United States, and 98 per cent. are left to the ravages of the "Great White Plague"; so let us, through pamphlets, like our Secretary has suggested, distribute them all over the State, and then the time will come for legislation.

Dr. FAISON, of Charlotte: I am always delighted when the State Board meets with us, because it always means something good for North Carolina. We have had enough talk within the past twenty-four hours to make every man think that some germ already had him.

Mr. Chairman, I am one who stands out with the opinion that there are so many laws—I am opposed to this namby-pamby way of doing things. There is but one way to manage tuberculosis, and that is to prevent it. This thing of curing tuberculosis is one of the things you put down among the exceptions of things. The only way to cure it is through prevention, and if I had the power in my hand to-day I would pass a law that would isolate every man, woman and child in North Carolina

who had tuberculosis. As Dr. Ferguson said in his paper, "it is one of the most easily prevented of all infectious diseases; and if it is so easy (and I agree with him), then we should pass laws that are right. I stand here abashed and ashamed that Charlotte, in her hundred years of history, has no law for the prevention of tuberculosis. All the law she has is the State law; but when I grow stronger, with the power of God Almighty, I propose to put on the statute books in Charlotte a law that will be a law that is worth something.

Now, gentlemen, in discussing tuberculosis, I do wish the medical men in North Carolina would quit using the word "contagious" in talking about tuberculosis. I know Dr. Weaver knows better than to talk about "contagion" in tuberculosis. It doesn't come in that class at all; the sooner they realize and accept this fact, the better. Tuberculosis isn't a contagious disease. It is a plain communicable disease that is preventable if you will do it—and we have the power to prevent it.

Dr. WEAVER: Let me correct the gentleman. I meant infectious.

Dr. FAISON: I want them to understand it is not contagious. We have only four or five contagious diseases in the world, and why you want to put down these things in that class is beyond my comprehension; but it is one of the infectious diseases that we should have to do with. Some are not so easily prevented as others, but this one—tuberculosis—we can put the doctors out of business if we will do what we ought to. Gentlemen, it is a preventable disease, and so long as you talk about educating the laymen to do this, it isn't worth a cent. Do something. Put your hand on them with the law and make them do; that is the way to teach the people to do things. I am absolutely of the opinion that that is the way to do, and I propose to stand here and do so, and the sooner we can get laws passed, the better. There is no question about that. I know that it will be hard. I know that men kick at new things. We have seen it in this town, where men have nearly been kicked to death because they wanted to do what was right. But who cares if he does get kicked when he is in the right? I would rather be kicked in the right than succeed in the wrong.

Dr. ALBERT ANDERSON: I just want to say a few words. I heartily agree with what Dr. Faison has said. I think the best

way to do this is by way of statute. I asked our Representative last year to introduce a bill in the Legislature, which he didn't do. He was so taken up with the bucket-shop bill that he never introduced this law on the subject of tuberculosis. And my idea was this: that if it is found in any community that any person is suffering with a cough for any length of time, make the laws so that he will have to have his sputum examined, and if it should be found that he has the bacilli in the sputum, then make it unlawful for him to ever spit on the ground again. Let each county furnish these people with cuspidors or paraffine bags to spit in, and in this way you bring it to the homes of the people who are suffering with this disease, and it will be the greatest means of curing the people that we could devise. And I agree with Dr. Faison that the way to do a thing is to do it.

Dr. MANN: Mr. President, I feel a delicacy in saying something after the older men have been talking, but I would like to tell something of what we have been doing in Durham. We have been working very faithfully on tuberculosis for the last four or five months. One man said he didn't believe in reporting tuberculosis to a patient—that it would be bad for him. That is all out of reason. Now, if it is right to report diseases in the cities and towns, it is right to do so in the country, and for that reason I am heartily in favor of having the cases in the country and towns reported. In Durham we have passed ordinances making the physicians report under penalty. It is true you can't go right down and make every physician report; the health officer must co-operate with the men and reason with them. I have gone to them personally and gotten reports that I would not otherwise have had. We have had this in force about one month, and I have already seen it is going to work well, and we have had several cases reported and the people have been totally ignorant of the disease and they have been glad to get the literature which we have given them. We have prepared special literature for the people to read. Most of the literature was copied from the northern cities. It is going to work well, and it will be altogether practicable to make it compulsory, and it is working that way in Durham.

Dr. HAYS: Mr. Chairman, it seems exceedingly difficult to get some very learned men in North Carolina to find out that

public opinion is the law of the land. This body does not make the laws of North Carolina, nor could we, if we had the power to make the laws, make men live under them or obey them. The law is but the expression of public opinion, and there is but one way for us to reach this problem, and we have got to write that way deep upon our hearts and remember it in our prayers, night and morning. It is: Education! Education! Education! Now, we are dealing with a condition and not with a theory, and I hope that no man who follows me will use any hair-splitting differences between definitions and fine theories. If it goes abroad that we have this day agreed among ourselves that tuberculosis is not contagious, it had been better had we had no meeting whatever. I do not question the gentleman's learning, but we have not time for hair-splitting differences. What we want to know is, if we can take any action here to-day by which fewer people in the next twelve months in North Carolina would die of tuberculosis than if we had not met here.

Gentlemen, I wish to make a few suggestions. We will have to become teachers of teachers, and I would suggest that we start with our schools. I have been impressed time and time again that the average man, woman and child in North Carolina is not reached so much through the printed page as through the spoken word; that the bacillus of tuberculosis is not so much in evidence where the people get their ideas through the printed page, and for that reason, and that alone, the pamphlet has not done all that we desire. Now, those who are going to leave the papers must carry the message where the pamphlet is not read. We must carry it first to the school-teachers. One of the best schools in North Carolina is a female school in my town. One of my nieces studied there this year. She studied all the ologies—more than I ever heard of before, but when it came to hygiene, which comes at the back of the book, the teachers stopped and went on, and she didn't know one bit more how to take care of herself, her health or the health of those hereafter dependent upon her, than if she had not been to that school. Therefore, I think we ought to make the effort to teach the teachers of North Carolina to disseminate the laws of health. First, in the graded schools we should ask the teachers to teach the little fellows the danger of sitting in a heated room,

so that they would not be willing to do so at home; and we should teach them the danger of sleeping in a room where there is no ventilation, so that they will tell their parents that they must not sleep in a room with the windows and doors closed. We can do that if we go to the teachers and ask them to teach those things. That is the second suggestion.

I would suggest that we make an appeal to the preachers. I have been to a patient and found that some good pastor had suggested to the patient that he take such and such a patent medicine. (Much applause.) That is an every-day occurrence, but I have never in my life heard a preacher in the pulpit (and I am a pretty regular church-goer) say anything about the laws of health or of ventilation; and I go to church and to the opera-house, where the authorities do not take the least precaution to see that the building is properly ventilated. Now, we might ask our preachers to read the pamphlet—not ask the poor, ignorant patient to read it—but we might take them to the preachers and ask those preachers to take them as the message from God. It may be that Dr. Lewis is the messenger all right, but he didn't originate the message; and if they will teach their congregation that the laws of health are the laws of God, then we will see tuberculosis stamped out in North Carolina.

In the third place, I would suggest that we tell our intelligent families, and whoever have influence and who can bring about reform, the danger that exists in permitting the laundry of our best people to be taken into houses that are infected with tuberculosis, smallpox, etc. Now, we know that tuberculosis is more prevalent among them; that they are less sanitary; that they live in rooms without a fire-place; that the windows are pulled down, the stove red-hot, the thermometer is about one hundred, and tuberculosis germs fill the air, and our laundry goes into that atmosphere, and when our clothes come home, if they have not been well ventilated, then beware! If we could take two or three practical suggestions and work along these practical lines and forget our fine theories and hair-splitting differences; if we would make a special campaign to the teacher, make a special campaign to the preacher, make a special campaign to the people who are going to influence the ignorant people, we would do

something, at least, to save a few human lives in North Carolina, and that in the near future.

Dr. KIRK, Hendersonville: I have listened to these views, Mr. President, but we cannot be too stringent in our lives, or in the enforcement of them, to correct this trouble; but while we are educating the public, while we are trying to disseminate all of this information and knowledge among the ignorant, let us not forget the poor unfortunate who has tuberculosis. We forget sometimes that they have feelings, you know, and if we expect to have a law efficiently carried out, there are very few men who wouldn't observe an expectoration ordinance—who wouldn't observe everything else, if they were not shunned and looked upon as lepers. Let's help our brother who has tuberculosis. I know of an institution that has a patient of mine who told me he was in New York; he pulled out a glass and expectorated in it in the street-car and almost caused a stampede, and he was shunned. He said he got off that car, and he expectorated next time on the floor, in another car, and nobody paid any attention to him. We want to show sympathy and tolerance to those who are afflicted, and not want to drive them like dumb cattle.

A man who has tuberculosis is not criminal. He is a danger to society, I will admit, but let's make the laws such as he can obey and he will be willing to do it. Every man has some love for his fellow-man; then let's not make it harder than we can help for him to obey the laws. I am not here to say that I do not believe in the most intelligent laws, but I am here to make a plea for those who are so unfortunate as to be afflicted by tuberculosis, that we may, in every way that we can, make it easier for him to obey those laws, and not shun him, but look upon him as a man who is trying to help his fellow-men and not disobeying the law.

Dr. LEWIS: I would like to say a word in explanation. I do not wish the session to understand that the pamphlet has fallen flat on the whole; the only place that the pamphlet has actually fallen flat is among the medical profession. This pamphlet has been sent to every preacher in North Carolina, begging him to read it and carry it out among his people, to preach the doctrine of prevention. The same way with the teachers. Every

teacher in North Carolina, white and colored, has had it, with a letter, and not only to instruct the children, but the families. Of course, we desire education. It isn't worth while to talk about laws until public opinion has been educated. Just to give you an illustration: To take the compulsory notification of tuberculosis—the doctors are here, but they "ain't a-gwine." Now, that theory is quite bad, but practically it is the truth. The subject was brought up in Raleigh, and I was appealed to to have a law passed, under penalty, reporting all cases of tuberculosis to the health officers of that city. When the gentlemen came to me, who were very much interested, I threw cold water on it, and they were very much astonished, no doubt; but I said to them, as I said to Governor Aycock at the time, "I simply cannot afford to advocate, with apparent sincerity even, something that I know perfectly well is not practical." I said, "Of course, I am not going to oppose it outright." It was tried, and what was the result? Six months afterwards—the penalty was twenty dollars for not reporting—I asked the health officer, "How many cases have been reported?" He said, "One!"

My friend on the left said he is afraid to tell the patient himself he has tuberculosis. If the doctor isn't going to tell the patient himself he has tuberculosis and give him warning if he doesn't follow such a course of action he is dead sure to die; if he doesn't tell the family—whether you call the disease infectious, communicable, or catching (applause), it doesn't make any difference what word you use, but it is a *catching disease*, and I agree with one gentleman that it would be a great misfortune if it should ever get out among the people that tuberculosis or consumption is not contagious, because "contagious" is the word the people use—he would, in my opinion, be criminally negligent. We scientific men make certain fine-drawn distinctions, but when we come to define the difference between infectious, contagious and communicable, it is a mighty hard matter for me to get at the difference.

Dr. Hays is right about it. The appeal was to enlist the physicians' co-operation for the people. The whole thing hinges upon the cordial co-operation of the doctor. You may pass any number of laws you please, you may distribute around among the laity all the information you please, but if the family physi-

cian, in whom the people have more confidence than other folks, if the family physician is indifferent on the subject, if he doesn't insist upon it, they don't care a thing for it; but if the physician says to the people, "Here is a case of consumption in your family; it is a catching disease; if you don't have the members of your family take certain precautions (which you will explain to them), the probability is that he will die, and other members of the family will catch it; it is my duty to let you know this fact," they will take these precautions. I will illustrate it by telling you that in the county of Richmond, in North Carolina, there lived in a certain house an old consumptive ex-Confederate, with a family of eleven; one was burned to death and the other ten died of tuberculosis. A negro man and his wife, already having consumption, moved in, and she died there. Three months after that another negro family, perfect types of health, ten in all, moved in, and every single one died of tuberculosis.

If the doctor has it in his heart to prevent the spread of this disease, and will put it to the patient and impress upon him that he should take these precautions, or otherwise infect the other members of the family, who are dearer to him than anybody else, and then tell the family if they don't take certain precautions they themselves will have the disease—if the doctor's heart is in it, I am satisfied in many cases (of course I realize the difficulty of managing the ignorant) those precautions would be observed. What we want is the active and cordial co-operation of the physicians of North Carolina in the education of the people as to the communicability of tuberculosis, as to the fact that it can be prevented, and to also give them hope that if it is taken in time it can be cured.

Dr. BURROUGHS: Mr. Chairman, I move that the Secretary's report be accepted.

Dr. THOMAS: It has been moved, sir, and has been ordered to be printed.

Dr. THOMAS: Before we adjourn, gentlemen, I will say Dr. Stevens will take what measures he sees fit to expedite the further organization of the society for the prevention of tuberculosis; and if there is nothing else before this conjoint session, it stands adjourned.

The VICE-PRESIDENT: I wanted to state that the cards distributed a few moments ago were for the names of those interested in this crusade against tuberculosis and who are willing to operate in the organization of a society for the prevention of tuberculosis. No money is wanted now. Those who are interested are requested to go across into the room occupied by the House of Delegates, and we will organize immediately. This can be done in about three minutes, and will not make any one late for dinner.

The Society here adjourned until 3 o'clock.

THE NORTH CAROLINA ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS.

Pursuant to a call issued by a committee appointed by the President of the State Medical Society, under resolution offered at the 1905 session, a number of the medical gentlemen in attendance on the fifty-third annual meeting of the Society at Charlotte, N. C., May 30, 1906, met together and organized the above-named association.

A constitution was adopted, which is herewith appended, after which the following directors were elected:

M. L. Stevens, Asheville; R. H. Lewis, Raleigh; J. Howell Way, Waynesville; George G. Thomas, Wilmington; James A. Burroughs, Asheville; James M. Parrott, Kinston; Ben. K. Hays, Oxford; W. H. H. Cobb, Goldsboro; Charles A. Julian, Thomasville; Watson S. Rankin, Wake Forest; Albert Anderson, Wilson; Kenneth M. Ferguson, Southern Pines.

On the following afternoon the directors met and held a short meeting.

Dr. M. L. Stevens, of Asheville, was elected President. Dr. J. Howell Way, of Waynesville, was elected Secretary, but declined, and suggested Dr. Ben. K. Hays, who was unanimously elected. Dr. Charles A. Julian was elected First Vice-President. Dr. Albert Anderson, of Wilson, was elected Second Vice-President.

It was resolved to hold the annual session of 1907 at the same time and place as the State Medical Society. Each member was requested to become a subscriber to a publication called *Outdoor Life*, published in the interest of the prevention of tuberculosis.

On motion of Dr. Julian, the Secretary was requested to issue a general invitation to the profession and other interested persons in the State to unite with the association and aid in its beneficent work.

The association adjourned to meet upon call of the President on the occasion of the fifty-fourth annual session of the State Medical Society, to be held at Morehead City, N. C., May, 1907.

M. L. STEVENS, M. D.,

BENJ. K. HAYS, M. D.,

President.

Secretary.

CONSTITUTION.

ARTICLE I.—NAME.

The name of the Association shall be "The North Carolina Association for the Prevention of Tuberculosis."

ARTICLE II.—OBJECT.

The object of the Association shall be the prevention of tuberculosis: (a) by the study of the disease in all of its forms and relations; (b) by the dissemination of knowledge concerning its causes, prevention and treatment, and by supplementing the work of the State Board of Health in this cause; (c) by such other means as may from time to time be deemed advisable.

ARTICLE III.—MEETINGS.

The meetings of the Association may be held at such times and in such places as may be directed in the by-laws.

ARTICLE IV.—INCORPORATION.

The names and residences of the incorporators are: M. L. Stevens, M. D., Asheville, N. C.; R. H. Lewis, M. D., Raleigh, N. C.; J. Howell Way, M. D., Waynesville, N. C.; James M. Parrott, M. D., Kinston, N. C.; W. H. H. Cobb, M. D., Goldsboro, N. C.; James A. Burroughs, M. D., Asheville, N. C.; Albert Anderson, M. D., Wilson, N. C.; Ben. K. Hays, M. D., Oxford, N. C.; George G. Thomas, M. D., Wilmington, N. C.; Charles A. Julian, M. D., Thomasville, N. C.; Watson S. Rankin, M. D., Wake Forest, N. C.; Kenneth M. Ferguson, M. D., Southern Pines, N. C.

BY-LAWS.

ARTICLE I.—MEMBERS.

SECTION 1. Any person who shall pay \$1 or more into the treasury of the Association shall have his name enrolled as a member for the year in which such payment is made.

SEC. 2. The payment of \$25 at one time shall entitle a member to a life membership.

SEC. 3. Persons who have, by original research or as sanitarians or as philanthropists, eminently aided in combating tuberculosis may be elected honorary members.

ARTICLE II.—OFFICERS.

SECTION 1. The Association shall, at its first meeting and annually thereafter, elect a Board of Directors. This board shall consist of twelve members, but may hereafter, at any regular or a special meet-

ing, be increased by electing one Director from each county (of the State) in which this Association has members.

SEC. 2. The Board of Directors shall make its own rules and shall have entire charge of the business and work of the Association. Committees shall have the power to execute only what is directed by the board.

SEC. 3. The Board of Directors shall annually elect from its own members a President, two Vice-Presidents, a Secretary and a Treasurer, who shall be the officers of the Association.

ARTICLE III.—COMMITTEES.

SECTION 1. The Board of Directors shall appoint an Executive Committee of five Directors, of which the President and the Secretary shall be members *ex officio*, to which shall be entrusted all the executive work of the Association.

SEC. 2. The Board of Directors is empowered to appoint representatives to the International Congress on Tuberculosis, the National Association for the Study and Prevention of Tuberculosis and the North Carolina State Medical Society. It shall also, from time to time, appoint such committees as may be necessary for scientific and educational work, and for the holding of meetings and congresses.

ARTICLE IV.—QUORUM.

Five Directors shall constitute a quorum of the Board of Directors.

ARTICLE V.—MEETINGS.

There shall be one stated meeting of the Association each year at a time and place to be fixed by the Board of Directors. Other meetings of the Association may be called by the Board of Directors at such a time as it shall deem proper. The Executive Committee shall hold stated and other meetings as may be directed by the rules of the Board of Directors.

ARTICLE VI.—MONEYS.

The moneys received from membership fees and from all other sources shall be used for defraying the expenses of the Association and for furthering its objects, under the direction of the Board of Directors.

ARTICLE VII.—AMENDMENTS OF CONSTITUTION.

Propositions to amend the Constitution may be presented in writing at any meeting of the Board of Directors, or of the Association, and may be voted on at the meeting of the Association next following: *Provided, however*, that no proposition for amendment shall be voted on within thirty days after its presentation, nor without at least twenty days' notice of the meeting at which it is to come up for consideration, which notice shall set forth the proposed amendment in full. An affirmative vote of two-thirds of the members present shall be required for the adoption.

ARTICLE VIII.—AMENDMENT OF BY-LAWS.

The By-laws may be amended in the same manner as the Constitution or by a two-thirds vote of the members present at a meeting of the Board of Directors: *Provided*, that in the latter case the proposition to amend has been presented in writing at a previous meeting of the Association, or of the Board of Directors, and that subsequently to such presentation twenty days' notice in writing has been given of the proposed amendment in the call for the meeting.

STATE LABORATORY OF HYGIENE.

BIENNIAL REPORT OF THE BIOLOGIST.

The State Laboratory of Hygiene was established by an act of the Legislature ratified March 4, 1905. It has remained from the beginning under the directorship of the present Biologist with one scientific assistant, a part of the time a stenographer, and an office boy, as working staff.

From March, 1905, to January 1, 1907, being one year and eight months, 2,749 samples have been analyzed in the laboratory. During the eight months of 1905 the number of samples was 692. During the twelve months of 1906 the number of samples was 1,135.

During both years approximately one-half the samples analyzed were sent in by public water companies. Of the rest about one-half were samples of water, representing as many different wells, sent in by physicians who suspected these waters to have caused typhoid fever. The remaining samples included tuberculosis sputa, diphtheritic exudates, feces, blood, urine, vomit and samples of parasitic worms.

The number of letters and reports mailed from the laboratory during 1906 was about 7,600. In addition a large number of circulars and notices to public water companies were mailed.

The Biologist has during this period prepared for the Bulletin of the Board of Health a number of special papers on health topics. One of these papers was republished entire in another State.

During 1905 there were registered in the laboratory forty-seven public water companies. During 1906 the number had increased to fifty-one, where it now remains.

The following table shows the general character of each of these water supplies:

Water Company or Supply.	Ownership.	Source of Supply.	Type of Filter used.	Average Hygienic Quality.
Albemarle -----	Corporate ..	Artesian well ----	None -----	Pure; rather hard.
Asheville ----- (city).	Municipal ..	Surface stream ----	do -----	Very pure; soft.
Asheville ----- (Buckeye Co.)	Corporate ..	do -----	do -----	do.
Brevard -----	do -----	do -----	do -----	do.
Charlotte ----- (city).	Municipal ..	do -----	Mechanical --	Fair to good; soft.
Charlotte ----- (Dilworth).	Corporate ..	do -----	None -----	Fair; soft.
Concord -----	do -----	Shallow well ----	do -----	Poor; soft.
Dunn -----	Municipal ..	Artesian well ----	do -----	Fair; soft.
Durham -----	do -----	Surface stream ----	Mechanical --	Poor to good; soft.
Edenton -----	do -----	Artesian well ----	None -----	Poor to fair; soft.
Elizabeth City ----	Corporate ..	Surface stream ----	Mechanical --	Poor to fair; hard.
Fayetteville ----	Municipal ..	do -----	None -----	Poor; soft.

Water Company or Supply.	Ownership.	Source of Supply.	Type of Filter used.	Average Hygienic Quality.
Fayetteville ----- (Fountain Head).	Corporate --	Springs -----	None -----	Poor; soft.
Graham -----	Municipal --	Artesian well -----	do -----	Fair to good; soft.
Gastonia -----	do -----	Surface stream ---	Mechanical ---	Fair to good; soft.
Goldsboro -----	do -----	do -----	do -----	do.
Greensboro -----	do -----	do -----	do -----	Good; soft.
Greenville -----	do -----	do -----	do -----	do.
Henderson -----	do -----	do -----	do -----	Poor to fair; soft.
Hendersonville -----	do -----	do -----	None -----	Good; very soft.
Hickory -----	do -----	do -----	Slow sand bed	Fair to good; soft.
Hot Springs -----	Corporate --	do -----	None -----	Good; soft.
Kinston -----	Municipal --	Artesian well -----	do -----	do.
Lexington -----	do -----	do -----	do -----	Good; hard
Lincolnton -----	do -----	Shallow well -----	do -----	Good; soft.
Louisburg -----	do -----	Surface stream ---	Mechanical ---	do.
Lumberton -----	do -----	do -----	do -----	Very poor; soft.
Monroe -----	do -----	Artesian well -----	None -----	Good; hard.
Morganton -----	Corporate --	do -----	do -----	Very pure; soft.
Mount Airy -----	Municipal --	Surface stream ---	do -----	Pure; soft.
New Bern -----	do -----	Artesian well -----	do -----	Fair; hard.
Oxford -----	Corporate --	do -----	do -----	Good; hard.
Pinehurst -----	Private ---	Spring -----	do -----	Very pure; soft.
Raleigh -----	Corporate --	Surface stream ---	Mechanical ---	Good; soft.
Reidsville -----	Municipal --	Shallow wells -----	None -----	Variable; general quality unsatis- factory.
Rocky Mount -----	do -----	Surface stream ---	Mechanical ---	Fair; soft.
Roxboro -----	do -----	Artesian well -----	None -----	Good; soft.
Salem -----	Corporate --	Surface stream ---	Mechanical ---	do.
Salisbury -----	Municipal --	do -----	do -----	do.
Sanford -----	do -----	do -----	None -----	do.
Southern Pines -----	do -----	do -----	do -----	do.
Statesville -----	do -----	do -----	Mechanical ---	do.
Spencer -----	do -----	Artesian well -----	do -----	do.
Wadesboro -----	do -----	Board well -----	do -----	do.
Tarboro -----	do -----	Artesian well -----	None -----	do.
Washington -----	Corporate --	do -----	do -----	Good; hard.
Waynesville -----	Municipal --	Surface stream ---	do -----	Fair to good; soft.
Wilmington -----	Corporate --	do -----	Mechanical ---	Good; soft.
Wilson -----	Municipal --	do -----	None -----	Poor; soft.
Winston -----	do -----	do -----	Mechanical ---	Good; soft.

In connection with the above table it is only fair to say that the showing is, as a whole, very creditable to the State. The average quality of all but a very few of these water supplies is excellent. When the laboratory first began these systematic analyses in 1903, we found that many of the water companies using the mechanical filtering process were running alum into the filtered water. At the present time we rarely find any trace of alum in the filtered waters sent us. The germ contents of all these filtered waters are comparatively low, and the groups represented are, in most cases, harmless, sporiferous saprophytes. The alum used as a coagulant in filtering water by the mechanical process has a powerful bactericidal effect. It acts in a destructive way upon these organisms, both mechanically and physiologically.

Artesian wells as sources of public water supplies for small towns seem to be growing in favor in this State, and most of the recently established supplies are of this class. All of the artesian waters of this State contain a high percentage of total solids, chiefly the sulphates and chlorides of soda, lime and magnesia. These artesian waters are wholesome, though they are apt to disagree at first with those who have been accustomed to soft, surface water. They are not well suited for steam boilers and other industrial uses. We have advised the managers of the more highly mineralized artesian supplies to install a softening plant, which will remove the larger part of the dissolved minerals—chiefly lime—and thus render the water soft and more desirable for both domestic and industrial uses.

In pathological work done for physicians the number of samples of suspected tuberculous sputum sent in is steadily increasing. About three-fourths of all samples of this kind now received show bacillus tuberculosis.

In this connection the Biologist desires to say that he keeps himself informed as to the most recent developments in controlling human tuberculosis, as published in German and French scientific periodicals. The consensus of opinion among working European biologists is that tuberculosis is rarely transmitted directly from cows to humans. This does not necessarily mean that there is any radical or specific difference between the germs of human and bovine tuberculosis. It simply means that germs habituated to parasitism on bovines do not easily or at once adapt themselves to the human environment, and as a consequence are less virulent and less able to overcome or counteract the natural protective secretions of the healthy human organism. In other words, most new cases of human tuberculosis seem to arise from some pre-existent human case or infection. The plain moral inculcated by this fact is that such possible infection should be more rigorously guarded against. There should be a stringent law requiring all public assembly and waiting rooms, public carriages, cars, jails, asylums, hotels, etc., to be period-

ically fumigated, and rented houses should be fumigated before a new tenant is admitted. The frequent sprinkling of city streets during the dry weather, and the daily, or more properly nightly, sweeping of such streets has an important influence upon preventing the spread of tuberculosis. A further desirable precaution is the enforced registration of consumptives with local boards of health, this registration to include transient visitors as well as permanent residents. All such registered consumptives should be furnished with literature giving special rules for hygienic living, with the view of preventing infection of others.

In the line of feces examination during 1906 much less work than in 1905 has been done in this laboratory. Nearly all the samples of this kind now sent in do, in fact, contain the hook-worm. A very few samples of feces showing tape-worm have been received, but this parasite seems rare in North Carolina.

The demand for examination of feces for hook-worm was very brisk during 1905, but during 1906 has greatly decreased. This decrease is probably due to the ease of diagnosing this disease from symptoms, as a typical case once determined by biological examination enables the physician to diagnose similar cases by the symptoms.

Regularly each fall, within a week or ten days after schools open, physicians begin to send in samples of throat exudate from suspected cases of diphtheria. The demand for this kind of work increases rapidly and averages three or four samples per day until about December 15th, when the demand begins to slacken and practically ceases about February 1st, to begin again the ensuing September.

There is a considerable and steady demand made upon the laboratory for complete urinary analysis. We now accept such samples when the cases seem to demand it, but do not encourage this line, as our present facilities will not permit it. The determination of the "Diazo reaction" of urine is, however, of considerable importance in diagnosing obscure fevers of suspected typhoid nature, and we are always willing to make this test, as well as the "Widal reaction" for typhoid. The two tests taken together can in most cases satisfactorily determine whether or not a patient has typhoid.

There is a small but pretty constant demand upon the Biologist for various special examinations in cases of obscure diseases. In this line we recently determined a case of infestation by *Filaria Bancrofti*. This worm is the cause of "*Elephantiasis*" in tropical countries. It is fortunately very rare in our latitude. A few samples have also been sent to the laboratory to be examined for bacillus gonorrhea. A number of samples of a maggot—the larva of the common blow-fly—have been sent by physicians who found them in stools of patients and mistook them for the hook-worm. A few samples of tumors have been sent in, but these we have had to decline, not having either facilities or time for this class of work. During these two years no

meritorious application from any physician, coming within our scope, has been refused by the laboratory, though for most of the time our force has been greatly overworked.

For the ensuing two years the laboratory, under present status, can depend upon a monthly income of about \$250 from public water companies. This income is, however, no more than the work of these companies costs. The State must specially provide for the cost of all work done free of charge for physicians and local health officers. Before the present Biologist took up the work such bacteriological analyses of water as were ordered by the Board of Health cost the State \$10 each. Under the present laboratory organization these analyses can be made at a net cost to the State of about \$3, but this actual cost must be provided. Hitherto the Biologist, in the endeavor to popularize the laboratory, has systematically and dangerously overworked himself in dealing with physicians' work, with serious consequences to his own health. This overwork he cannot undertake to continue. For the best results, as regards the public health, the laboratory should receive from the State treasury an annual appropriation of not less than \$2,000.

Respectfully submitted,

GERALD MCCARTHY,
Biologist.

INSPECTION OF STATE INSTITUTIONS.

THE CAPITOL AND THE BUILDINGS OF THE SUPREME COURT AND OF THE DEPARTMENT OF AGRICULTURE.

TO THE COUNCIL OF STATE,

Raleigh, N. C.

GENTLEMEN:—The undersigned, a committee from the State Board of Health, in compliance with instructions, has made a sanitary inspection of the Capitol Building and the buildings occupied by the Agricultural Department and the Supreme Court. From a sanitary standpoint, we found nothing particularly objectionable.

The floors in the water-closets, being of wood, are not very desirable and would be more sanitary if replaced by tile, especially in the Capitol. Ordinarily, with the every-day population, they are not at present a nuisance, but when the Legislature is in session and on public occasions, when the city is full of people, they would easily become harbors of ill odors that would be hard to remove.

In view of the early meeting of the Legislature, we would repeat our regular biennial suggestion, that the ventilation of the Senate Chamber and House of Representatives be supplemented by keeping open fires in all the fire-places.

Respectfully submitted,

W. P. IVEY, M. D.,

RICHARD H. LEWIS, M. D.,

Committee.

STATE EDUCATIONAL INSTITUTIONS.

THE UNIVERSITY,

BOARD OF TRUSTEES,

University of North Carolina.

GENTLEMEN:—Pursuant and agreeably to the request of the President of the State Board of Health, I have made an inspection of the University buildings at Chapel Hill, and have to report as follows:

The condition of things sanitary at the University of North Carolina is good as far as it goes, and there is little or no sickness amongst the student body or in the village; but there is much to be desired, and a deal could be done in the way of improvement were the money forthcoming to meet the requirements. The fact is, inadequacy stares one in the face at every point. The State may be doing its best for the University, but if I were the Legislature I would endeavor to find ways and means for doing more. Its salubrious situation, the ability, broad-mindedness and undagging zeal

which has characterized the executives and faculties since those dark *post-bellum* days have so appealed to our people at home and abroad that its popularity is far and away ahead of its accommodations and sanitary appointments.

Dormitories, mess halls and even lecture rooms are cramped. The quality of the water supplied to the University is good and the supply at the source sufficient, but is not at all what it should be at the distributing point. The standpipe should be at least twenty feet higher, and this should be provided for at once in order that water may reach freely and at all times the upper dormitories and floors of the buildings on high ground. Both the filter and receiving basin, or settling plant, are entirely inadequate. I should say 50 per cent. short; and as the University has, at this writing, twice as many students as it can house, it is to be hoped that the water supply will receive the attention this splendid institution of learning merits.

The little infirmary is wholly inadequate and entirely out of place, but, as I am informed that it is to be moved in the very near future to another and more suitable place on the grounds, I shall only take time to note here that the building should be enlarged to meet the requirements. It now has accommodations for eight beds. It should be at least twice as large. This could be accomplished at a small cost and is eminently needed.

Before leaving the University I seize the moment to express the hope that the time is not far distant when a landscape gardener may be engaged to lay out a scheme—to be gradually worked up to—whereby the campus may become what it should be, an object-lesson to us all on the esthetic side of life, delighting the eye and pointing to the propriety of keeping ourselves well groomed and healthy and as near as may be in harmony with our surroundings.

I am asked to give an opinion as to the dangers which may arise from the establishing of some cesspools at the east end of Chapel Hill. I have inspected these plants—if they might be so termed—and after deliberate thought I cannot see that they are in anywise a danger to the community now or likely to become so. These people own their own premises. These are on a high ridge, with the best natural drainage. They have a water supply from the University plant. They have no wells, nor are there any wells in the immediate neighborhood, and if there were they would not be down in the bottom. Chapel Hill abounds in wells, and uses the old-fashioned privies, the usual condition of which need not be commented upon here. Indeed, I take it that these householders, who own their own premises and can and will care for the disposal of their sewerage by the system now installed, are less a menace to the community than those who use wells and privies, of which there are not a few in Chapel Hill.

To sum up: Cesspools are to be condemned, in the light of our present knowledge of things; so are wells and privies, but it seems

to me that these cesspools, under the circumstances, are along the line of open privies, and can be just as easily disinfected and made sanitary and are far safer, as there are no wells in the neighborhood. In other words, it does seem to me that there should not be a hard and fast rule made which is next to impossible to carry out; and it is my individual opinion that the Board of Aldermen will, after careful thought, see the matter as I do.

Yours very truly,

S. WESTRAY BATTLE, M. D.

THE COLLEGE OF AGRICULTURE AND MECHANIC ARTS.

STATE BOARD OF AGRICULTURE,

Raleigh, N. C.

GENTLEMEN:—The undersigned, having been appointed by the State Board of Health a committee to make a sanitary inspection of the College of Agriculture and Mechanic Arts, having discharged that duty on October 23, 1906, beg leave to make the following report:

The sanitary condition of the College, as a whole, is good, and we note with pleasure that efforts are being made to make it still better. A committee from your honorable body has recently reported a list of recommendations looking to the improvement of sanitary matters as to water, ventilation, drainage, etc. All of them are good, and we would urge that they be carried out as speedily as possible.

It is a matter for congratulation that a sewerage system is now being installed, and we would recommend that, just as soon as connections are made, the surface privy be removed, and so effectually removed that not even a memory of it should remain. This being done, it would not be a bad idea to remove the barn to a place across the run, in order to more effectually remove the nuisance of flies, which is no small factor in the transmission of disease.

From a sanitary standpoint, the advantage of a system of driven wells in an isolated spot over an open well in the main thoroughfare, closely surrounded by several buildings full of people, is so much in favor of the former that we think it would be the part of wisdom to do away with your present well in the yard and depend upon one water supply, bestowing upon that your individual care and attention.

Again, in solving your health problem, mosquitoes must receive a part of your attention, and to this end, with the privy, barn and well removed, a thorough system of surface drainage should be inaugurated, and then your back premises, sown in grass, will be made as picturesque and beautiful as the front.

Very respectfully,

W. P. IVEY, M. D.,

RICHARD H. LEWIS, M. D.,

Committee.

STATE NORMAL AND INDUSTRIAL COLLEGE.

BOARD OF DIRECTORS,

*State Normal and Industrial College,**Greensboro, N. C.*

GENTLEMEN:—The undersigned, a committee appointed by the State Board of Health, visited and inspected the State Normal and Industrial College at Greensboro on the 25th ult., and beg to submit the following report: We were treated with marked consideration and were taken over the buildings and grounds. The water used is from the City Water Works, but before drinking it is thoroughly sterilized by boiling, the Forbes apparatus being employed. This should give a perfectly sterile and pure water, free from all infectious germs. The sewerage and water-closets are the best results of sanitary plumbing obtainable. Much attention is given to ventilation and the free use of the bath tubs is insisted on, and cleanliness is in evidence on all sides. Some doubt is expressed as to their being able to furnish meals at a maximum cost of six cents per meal. This is, we think, rather scant allowance on the part of the Legislature, at the present cost of food stuffs. The College has a herd of cows, and much care is given to the milk supply used by the students.

Very respectfully submitted.

THOMAS E. ANDERSON, M. D.,

W. O. SPENCER, M. D.,

Committee.

AGRICULTURAL AND MECHANICAL COLLEGE FOR THE COLORED RACE.

BOARD OF DIRECTORS,

*A. and M. College for the Colored Race,**Greensboro, N. C.*

GENTLEMEN:—The undersigned, a committee appointed by the State Board of Health, visited and inspected the Agricultural and Mechanical College for the Colored Race at Greensboro on the 26th ult., and beg to submit the following report: The College is a credit to the State and kept well in hand by the efficient President, Dr. Dudley. The rooms, buildings and grounds are well kept. The water supply is from the City Water Works and one well which seems properly guarded. The institution has no sewerage and surface privies are in use, which are kept as sanitary as conditions will admit. We strongly recommend a system of sewerage for this institution. Connection with the city system can be effected and should be at the earliest available time. The institution has a herd of cows, and much care is given to the milk supply used by the students.

Very respectfully submitted,

THOMAS E. ANDERSON, M. D.,

W. O. SPENCER, M. D.,

Committee.

SCHOOLS FOR THE DEAF AND BLIND AT RALEIGH.

TO THE BOARD OF DIRECTORS,

*Schools for the Deaf and Blind,**Raleigh, N. C.*

GENTLEMEN:—In compliance with the provisions of an act relating to the Board of Health, the undersigned committee from that body has made a sanitary inspection of the two schools under your charge and report that, as to general particulars, cleanliness, ventilation, water supply, sewerage, etc., we found them in an excellent condition. We note with pleasure that our former recommendations in regard to providing sick rooms for isolating those sick with contagious and infectious diseases have been complied with.

The cement floors in the basements have added much to the facilities for exercise within doors, but your population needs much exercise out of doors, and we would suggest that opportunities for out-of-door exercise be improved by making paved walks and providing a perfect system of surface drainage. Surface drainage would also aid much in removing the mosquito, a menace to health as well as a worrying pest.

No time should be lost in providing suitable fire-escapes at both buildings.

At the colored school we found a few defects in plumbing, such as stoppage of waste pipes to bath tubs and urinals, allowing water and urine to run over on the floor. These, we take it, were only temporary, and in the main the colored department is very well kept.

At the colored school we also found that there is no ventilation in the associated dormitories, except from windows opening on the outside. While this is good in ordinary weather, we think some other ventilation should be provided, for in damp and extremely cold weather; open windows on a room full of children would not be desirable. We also found in these dormitories two children sleeping in a single bed. There was no crowding as to room capacity, but we think this is somewhat crowding bed capacity.

Very respectfully,

W. P. IVEY, M. D.,

RICHARD H. LEWIS, M. D.,

Committee.

SCHOOL FOR THE DEAF AND DUMB AT MORGANTON.

BOARD OF DIRECTORS,

School for the Deaf and Dumb, Morganton, N. C.

GENTLEMEN:—We, the undersigned, a committee appointed by the State Board of Health to inspect the school under your charge, beg leave to report:

We found the institution in excellent sanitary condition, on the whole, but we were disappointed to see that our recommendation in regard to the basement floor, made in a previous report, had not been carried out. This floor is of an inferior quality of brick, very irregular, and liable to produce dust. We would respectfully repeat our former recommendation, that the basement floor be properly cemented.

We were afforded every facility by Superintendent Goodwin.

Respectfully,

GEORGE G. THOMAS, M. D.,

RICHARD H. LEWIS, M. D.,

Committee.

OXFORD ORPHAN ASYLUM.

BOARD OF DIRECTORS,

Oxford Orphan Asylum.

GENTLEMEN:—At the request of the President of the State Board of Health, I proceeded to Oxford and inspected the institution under your charge. To the asylum for white children, under the guidance of Colonel Hicks, I cheerfully accord a clean bill of health, and I have no unfavorable comment to make on its sanitary condition. The system of sewerage and water supply needs no special mention, as nothing new has been installed or needed since the last inspection. The water supply, from a deep well, is abundant and of excellent quality. I was most favorably impressed with the general cleanliness of the main institution and the cottages throughout, and an atmosphere of happiness seemed to prevail. I was informed that since the water supply, obtained at a depth of several hundred feet, has been installed there has been notably less sickness.

Yours very truly,

S. WESTRAY BATTLE, M. D.

ASYLUM FOR COLORED ORPHANS.

BOARD OF DIRECTORS,

Asylum for Colored Orphans, Oxford, N. C.

GENTLEMEN:—Representing the State Board of Health, I have made an inspection of your asylum. The management of this institution for the care and education of the colored orphans, it appears to me, is doing its very best to make a creditable showing. The privies are well situated, away from the buildings, and are cleaned every day. The water supply is from two driven wells. I found here no sickness and the children looked clean and happy. The buildings are shabby, but well kept. The ranges do not appear to me to be large enough to meet the requirements, but the cook said if a small oven

for baking bread was added that it would very much lessen her labors and facilitate the serving of meals. This could be done at a very small cost.

Yours very truly,

S. WESTRAY BATTLE, M. D.

HOSPITALS FOR THE INSANE.

HOSPITAL AT RALEIGH.

THE BOARD OF DIRECTORS,

State Hospital for the Insane, Raleigh, N. C.

GENTLEMEN :—The undersigned, appointed a committee by the State Board of Health to inspect your institution, have performed that duty and are pleased to report that its sanitary condition is excellent. The water is ample and good, the food and clothing of the patients sufficient as to quality and quantity, the sewerage in proper repair and the surroundings in general healthful.

We would that the old building could be made to conform to some of the appointments of the new, as to light, ventilation, tiling in bathrooms and water-closets.

While we recognize that it is almost an impossible thing to do in a hospital for the insane, yet we feel that we should not omit the suggestion that there should be separate wards for the tuberculous patients. This leads up to another suggestion, that screened porches should be provided that would enable the feeble and aged to get the benefit of fresh air and sunshine. If these could not be general, at least one in connection with an infirmary might be had.

The water supply at present, being from the Wake Water Company, is all that could be desired, except as to cost. We were informed that the bill for water for the preceding month was \$185, nearly double the minimum estimate before the connections were made. If the population increases, as it surely will, the water bill will be very burdensome, and in the effort to keep down expenses too little water will be used, which in a hospital for the insane is most harmful. To provide an ample supply of water for as little money as possible is, we think, a question that should engage your attention right now, while you have the opportunity of buying a watershed near at hand at a price the interest on which would be much less than \$185 per month.

Very respectfully,

W. P. IVEY, M. D.,

RICHARD H. LEWIS, M. D.,

Committee.

HOSPITAL AT MORGANTON.

BOARD OF DIRECTORS.

State Hospital, Morganton, N. C.

GENTLEMEN:—The undersigned, a committee from the State Board of Health, on August 21st made an official inspection of the hospital. We are glad to report that we found the general sanitary conditions most excellent, with one important exception. This exception was the imperfect classification of the patients. This, we learned from your Superintendent, could not be avoided, on account of the overcrowded condition of the institution. Knowing as we do the overwhelming and insistent demands upon you for room for the many outside insane, we feel, while deprecating the fact, that criticism of the management would not be justifiable. We appreciate the difficulties of the situation and are satisfied that you are doing the best you can with the means at your disposal.

The most serious result flowing from this imperfect classification is the intermingling of tuberculous patients with the uninfected. The fact that tuberculosis is a communicable disease is now thoroughly established. It is always transmitted from one case to another, either directly or indirectly. While tuberculosis is directly transmitted by kissing, the more frequent method of direct conveyance is through the fine mist or spray, the minute droplets of which are loaded with the bacilli, which is expelled into the air in loud talking, laughing, sneezing and coughing. It has been demonstrated by actual experiment that the bacilli are propelled in the acts referred to as far as a yard. It has also been shown that guinea pigs have been infected by a consumptive's talking and coughing into a box containing them—in one experiment six out of twenty-five contracting the disease and dying from it.

The method of transmission that is generally accepted as the most common is indirectly, through the dried sputum, which in the form of dust floats in the air and is inspired directly into the lungs. Acting upon this belief the chief effort in the prevention of tuberculosis is to instruct the patient so to care for his own sputum that it can never become dry before its destruction—by spitting into cuspidors containing a disinfectant, or at least water, upon bits of cloth to be burned, etc. This manifestly requires intelligent interest and conscientious care on the part of the patient. It is extremely difficult to get consumptives in their right minds to take these precautions, and utterly hopeless, of course, in the mentally alienated. They spit on the floor, walls, bedclothes, and anywhere and everywhere, and talk and cough directly into one another's faces without hesitation. With the most scrupulous and painstaking care, efficient disinfection is absolutely out of the question.

Owing to the impaired vitality associated with their condition and increased by confinement, the insane are particularly susceptible to

the infection. The mortuary statistics of ninety-eight American asylums, as tabulated by Dr. Babcock, show the mortality from tuberculosis in six to be 5 per cent, or less, and in the remaining ninety-two from 10 to 60 per cent. of all deaths occurring in the institutions. Upon consulting the reports of your hospital, we find the average percentage from its opening to the beginning of the current biennial period is a little over 22 per cent., while for the past twenty months it is well over 35 per cent.—a very marked increase.

In a paper entitled "Sanitation in Asylums for the Insane, with Especial Reference to Tuberculosis," in the *American Journal of Insanity* for October, 1902, Dr. McCallum, superintendent of the asylum at London, Ontario, says: "With our eyes open to this danger, is it not reprehensible neglect to allow such a state of affairs to continue? Are we not betraying a trust in taking charge of these people only to expose them to a disease almost as horrible as that for which they have sought our help?"

But, unfortunately, the danger is not limited to the insane. Every patient returning to his home with tuberculosis becomes a focus of infection to his family and other associates. So it appears that an asylum under present conditions might be regarded as a hotbed for breeding tuberculosis and disseminating it through the State. In this aspect of the subject it is a matter not limited to the asylum, but one of great importance to public health in general.

Another matter of practical importance in its bearing upon the administration of the hospital is the effect upon the attendants. If those seeking such a position realized the risk they ran, the number available for their work would be greatly and probably inconveniently curtailed—and the people are learning very rapidly the dangers of infection.

We find that your Superintendent in three successive reports—1896 to 1902, inclusive—urged the separation of the tuberculous from the other insane, and in our last report we briefly called attention to its importance.

We would respectfully recommend that all tuberculous patients be cared for in special colonies, or, if that be not feasible, in separate buildings, or, at the very least, in special wards. There is a movement on foot to enlarge the accommodations for the insane. Should this be done, a part of the additional room should be specially arranged for the particular care of the tuberculous, separate from the others. They must be cared for anyway and the additional cost of making special arrangements for them would be immaterial. But whether the expense be great or small, justice, humanity and sound economy demand that it be met by the State promptly and fully. The utter helplessness of these poor afflicted people should of itself insure them against exposure to risk of infection by the most fatal of all diseases. We believe that the representatives of the State,

when they realize the situation, will meet it, and we earnestly hope that your honorable board may obtain from the next General Assembly the funds necessary.

Very respectfully,

GEORGE G. THOMAS, M. D.,

RICHARD H. LEWIS, M. D.,

Committee.

HOSPITAL FOR THE COLORED INSANE AT GOLDSBORO.

BOARD OF DIRECTORS.

Eastern Hospital for the Insane, Goldsboro, N. C.

GENTLEMEN:—Representing the State Board of Health, I have made the usual sanitary inspection of the hospital under your care, and beg leave to report:

I am pleased to state that I found the general sanitary conditions as good as the condition of the buildings will allow. Everything was clean as could well be, but some of the floors in the old building are very rough and worn, with large cracks for harboring dirt which cannot be removed. I would advise the relaying of these floors, and finishing all floors with some suitable filler, so that they may be more thoroughly and easily cleaned, and for the purpose of preventing the wear that must come from the necessarily frequent scouring of the raw wood. Oiled or paraffined floors can be much more easily cleansed, and without any appreciable wear.

The water-closets could be materially improved. Modern plumbing should be substituted for that of antiquated pattern remaining in several of the older ones. The cement floors could be made much better by cutting out and refilling the cracks in the old ones, and by skim-coating the new ones, which are rather rough, with a mixture of the very best cement and extra clean and sharp sand, at the same time filling the cracks between the blocks of which they are made. The walls, now of a rough sand finish, could be greatly improved by a coat of soapstone finish, which, being impervious to water, can be washed with impunity. It is not very expensive, and can be put on as easily as plaster of Paris.

The four surface privies on the outside should be abolished.

I was much gratified to note the provision that has been made for separating the tuberculous from the uninfected patients. The intermingling of these two classes when by any possibility it can be prevented, the exposure of those already sorely smitten, helpless and entirely at our mercy, to an even greater affliction cannot be defended. But while the present arrangement is probably the best available under prevailing conditions, it could be improved upon, and if the General Assembly, as seems to be probable, shall make sufficient provision for the proper care of the insane, entirely separate

quarters specially designed for housing the tuberculous should be erected.

The water supply from the deep well and the neighboring branch is good and ample. I would suggest, however, that a filter be provided for the removal of the mechanical impurities, which I was informed frequently clog the plumbing.

I beg to call your attention to the absence of fire-escapes and to urge upon you their installation as soon as possible. Should a fire occur and loss of life result for the lack of them, it would necessarily be a source of endless regret to those responsible for these helpless people.

The institution is at present overcrowded, but the new building now nearing completion, your Superintendent informed me, would only be sufficient to properly provide for the present surplus population and the new cases that may, according to past experience, be expected during the current year. So, steps should be taken at once looking to the erection of still another building, that it may be ready in time to prevent such congestion as now exists. Should the General Assembly provide special institutions for epileptics, the removal of about thirty of this class from your hospital would give some relief. I believe this should be done, and while it is more an economic than a sanitary question, I fully concur in the suggestion that the plant for colored epileptics should be located near enough to your hospital to be under the same general management, and at the same time allow of lighting and laundering from your plant. By such an arrangement several thousand dollars could be saved yearly, and at the same time a more skilled and experienced supervision be exercised over the new institution.

I need not say that I was accorded every courtesy by the Superintendent and his associates.

Very respectfully,

RICHARD H. LEWIS, M. D.,

For the Board of Health.

THE STATE'S PRISON.

BOARD OF DIRECTORS,

State's Prison.

GENTLEMEN:—The undersigned, a committee appointed by the State Board of Health to make the regular biennial sanitary inspection of your buildings, report that they performed that duty on October 23, 1906, and are pleased to state that the sanitary condition of both the prison department and the department for the criminal insane is good. The premises are clean, the plumbing in good repair, and the health of the inmates properly guarded.

In the department for the insane it is especially desirable that the floors of the water-closets and bath-rooms should be of some non-absorbent material—tile or cement. They are of wood at present, which makes it hard to keep them clean and free from odor.

In the prison department we note that there is a separate ward for tuberculous prisoners. We would that this could be provided also in the insane department.

In the department for the insane the stairway is entirely within, is of wood, is dark and would be a poor means of escape in case of fire. A well-lighted, fire-proof stairway and ventilator, opening on the outside as well as in the wards, would be a vast improvement.

The well, an open one covered with boards, close to the main building and steam house, does not meet the strict requirements of modern sanitation. It should be abandoned in favor of some supply that would be less liable to infection.

Very respectfully,

W. P. IVEY, M. D.,

RICHARD H. LEWIS, M. D.,

Committee.

SEWAGE DISPOSAL IN RELATION TO PUBLIC WATER SUPPLIES.

The most important thing that has occurred in the sanitary history of our State during the past two years is the decision of the Supreme Court in *Durham v. Eno Cotton Mills*.

Section 13 of "An Act to Protect Water Supplies" reads as follows:

No person, firm, corporation or municipality shall flow or discharge sewage into any drain, brook, creek or river from which a public drinking-water supply is taken, unless the same shall have been passed through some well-known system of sewage purification approved by the State Board of Health. Any person, firm, corporation or the officer of any municipality having this work in charge who shall violate this section shall be guilty of a misdemeanor, and the continued flow and discharge of such sewage may be enjoined by any person.

The Durham Water Company complained to the Secretary of the Board of Health that the Eno Cotton Mills continued to violate the law in this matter, and requested that he try to have it arranged without compelling them to resort to the courts. To this end the said Secretary corresponded with the mill management, visited the mills and had a personal interview with the president and secretary of the same. Later, the secretary and superintendent of the mills appeared before the Board at its annual meeting at Greensboro, in May, 1905, and the matter was thoroughly discussed, the Board deciding that the installation of a septic tank would, for the present at least, meet the requirements. Nothing was done, however, and the city of Durham brought suit in the Superior Court to enjoin the mills from continuing the flow of raw sewage into the Eno River, from which the city obtained, in part, its water supply. The injunction was granted and the case was appealed by the mills to the Supreme Court. This tribunal of last resort sustained the Court below in an able opinion by Justice Walker, which is given below. The effect of this wise decision upon the public health in the years to come, which are destined to witness great growth in population, especially in towns and

cities and in manufacturing enterprises of various kinds, will be very great. The attitude of the Board of Health has been throughout a conservative one, its desire being to subject the mills to as little trouble and expense as might be consistent with safety to the people using the water. The final settlement of this matter, as set forth in the following correspondence, shows this:

LAW OFFICE OF FULLER & FULLER,

DR. R. H. LEWIS,

DURHAM, N. C., July 18, 1906.

Raleigh, N. C.

DEAR SIR:—Please let us know the present status of the matter of sewage purification plant to be installed by Eno Cotton Mills under order of the Court in the case of *City of Durham v. Eno Cotton Mills*. We will thank you to let us have as full information about this matter as practicable.

Yours very truly,

FULLER & FULLER.

FULLER & FULLER,

RALEIGH, July 19, 1906.

Durham, N. C.

GENTLEMEN:—In reply to yours of the 18th inst., I beg to say that my last letter, under date July 12th, to the president of the Eno Cotton Mills reads as follows:

"I am just in receipt of a letter from Mr. Ludlow, Engineer of our Board, in which he agrees with me in the opinion that the method of disposal of the night soil of your factory by removal from surface privies and burial would be satisfactory, so far as the protection of the water supply of the city of Durham is concerned.

"While in Charlotte on yesterday, I was talking to Mr. D. A. Tompkins in regard to this matter and he mentioned that his company had manufactured for just such conditions iron pans which were steam heated and ventilated by an iron smokestack. He said they worked very well indeed, there being no odor and the remains of the excrement were simple dry dust, which was removed at proper intervals without trouble. This plan would, no doubt, be very satisfactory, and possibly it might be worth your while to look into it."

After our visit to Hillsboro I conferred with Mr. Ruffin and told him, while the Board would be satisfied with a septic tank, it would be more satisfactory to all parties for him to abandon his sewerage system altogether and bury all the night soil, and he agreed to carry it out in that way.

He proposes to bury the night soil on the other side of the railroad, which is, as I understand it, at least two or three hundred yards or

more from the river bank. The night soil will be plowed under. This being carried out, I do not think there will be any ground for complaint on the part of the water company.

Very truly yours,

RICHARD H. LEWIS, M. D.,

Secretary.

RALEIGH, July 12, 1906.

MR. A. J. RUFFIN,

President Eno Cotton Mills, Hillsboro, N. C.

MY DEAR MR. RUFFIN:—I am just in receipt of a letter from Mr. Ludlow, Engineer of our Board, in which he agrees with me in the opinion that the method of disposal of night soil of your factory by removal from surface privies and burial would be satisfactory, so far as the protection of the water supply of the city of Durham is concerned.

While in Charlotte on yesterday, I was talking to Mr. D. A. Tompkins in regard to this matter and he mentioned that his company had manufactured for just such conditions iron pans which were steam heated and ventilated by an iron smokestack. He said they had worked very well indeed, there being no odor and the remains of the excrement were simply dry dust, which was removed at proper intervals without trouble. This plan would, no doubt, be satisfactory, and possibly it might be worth your while to look into it.

Very truly yours,

RICHARD H. LEWIS, M. D.,

Secretary.

ENO COTTON MILLS,
HILLSBORO, N. C., June 30, 1906.

DR. RICHARD H. LEWIS,

Raleigh, N. C.

MY DEAR DOCTOR:—Answering in part your letter of June 27th, I beg to ask if it will not suffice for us to cover up the matter in question with a one-horse Chattanooga plow rather than a two-horse plow, it being understood that all of the fecal waste shall be deposited on the north side of the railroad, which, in my judgment, is at least 500 yards from the river.

My desire to have this done with a one-horse plow is due to the fact that the party who is to do this work has one horse only and it would entail a much greater loss to us to hire another horse.

With kind regards, I am,

Yours truly,

A. J. RUFFIN,

President.

RALEIGH, July 7, 1906.

MR. A. J. RUFFIN,

President Eno Cotton Mills, Hillsboro, N. C.

MY DEAR SIR:—My stenographer having returned to work, I am now able to answer your letter of June 30th, asking "if it would not suffice for us to cover up the matter in question with a one-horse Chattanooga plow rather than a two-horse plow, it being understood that the fecal waste shall be deposited on the north side of the railroad, which, in my judgment, is at least 500 yards from the river." Deposited this distance from the river, I believe it would be sufficient to cover the waste with a one-horse plow.

Very truly yours,

RICHARD H. LEWIS,

Secretary.

WINSTON-SALEM, N. C., July 2, 1906.

DR. RICHARD H. LEWIS,

Secretary, Raleigh, N. C.

MY DEAR DR. LEWIS:—I am in receipt of yours of June 27th, relative to the sewage disposal of the Eno Cotton Mills, at Hillsboro, and note that the factory people desire to abolish the sewer and collect their sewage in a surface privy, to be emptied and the sewage buried not less frequently than once a week, and asking my opinion relative to this method of disposal of the mill sewage.

I do not think it is a good plan for the mill people to pursue, from their own standpoint, and feel apprehension that it will cause them much nuisance and trouble to keep it in shape; however, I do not see that we have any authority to prevent their adoption of this method, as our only authority is to prevent the contamination of the stream by emptying the raw sewage into it, and their plan, as I understand your letter, guarantees that none of the sewage will be turned into the stream.

Very truly yours,

J. L. LUDLOW.

DURIHAM v. COTTON MILLS.

(Filed May 28, 1906).

Water and Water Courses—Rights of Riparian Owners—Reasonable Use—Pollution—Nuisance—Injunction—Protection of Public Drinking Supply—Statutes—Constitutional Law—Due Process—Police Power—Public Health.

1. A riparian owner has the right to have the stream flow by or through the land in its ordinary purity and quality without any unnecessary or unreasonable diminution or pollution by the owners above.
2. The several proprietors along the course of a stream have no property in the flowing water itself, which is indivisible and not the subject of riparian ownership, but each one may use it as it comes to his land for any purpose to which it can be applied beneficially without material injury to the just rights of others.
3. Whether the upper riparian proprietor is engaged in a reasonable exercise of his right to use the stream is a question for the jury, under the proper guidance of the Court.
4. Injunction is a proper remedy to prevent the fouling of the water of a running stream by its improper and unreasonable use when prejudicial to the rights of others interested in having the water descend to them in its ordinary natural state of purity.
5. When the interposition by injunction is sought to restrain that which it is apprehended will create a nuisance, the proof must show that the apprehension of material and irreparable injury is well grounded upon a state of facts from which it appears that the danger is real and immediate.
6. In an action by the city to enjoin defendant from emptying sewage and waste material into a river seventeen miles above the city's intake, the opinion of several physicians and laymen that the pollution at the outlet of the defendant's sewer will injuriously affect the water at the intake and endanger the health of the citizens who use the water, without an analysis of the water at the point of intake, is insufficient, under the facts and circumstances of this case, to authorize injunctive relief, especially where defendant's proof shows that there are many obstructions to the passage of deleterious matter and many natural means of purification between the site of defendant's mill and the intake.
7. Revisal, sec. 3051 (Acts 1903, ch. 159, sec. 13), prohibiting the discharge of sewage into any stream from which a public drinking supply is taken, is not confined to the watershed of fifteen miles above the intake, as defined in sections 2 and 3 of said act

(Rev., secs. 3045, 3046), but extends beyond fifteen miles from the intake of any stream from which the water is taken to be supplied to the public for drinking purposes.

8. Revisal, sec. 3051 (Act* 1903, ch. 159, sec. 13), prohibiting the discharge of sewage into any stream from which a public drinking supply is taken, without reference to the distance of such discharge from the point of intake, is not unconstitutional as a taking of property without condemnation and without compensation, but is a valid exercise of the police power of the State to secure the public health.

ACTION by the city of Durham and T. A. Mann against Eno Cotton Mills, pending in the Superior Court of Durham, and heard by *Judge G. S. Ferguson*, at Chambers in Durham, on February 10, 1906, upon a motion for an injunction to the final hearing.

The action was brought for the purpose of enjoining the defendant from emptying its sewage into the waters of the Eno River, from which stream the plaintiffs allege the water supply of the city of Durham is obtained partly in the summer months. The material part of the complaint is as follows:

That the defendant owns and operates a cotton factory located about three hundred feet from Eno River, at the town of Hillsboro, in Orange County, North Carolina, and employs in and about its factory about three hundred operatives.

That said defendant maintains water-closets in its said factory for the use of its said operatives and the deposits of human excrement therein are flowed and discharged through an eight-inch terra-cotta sewer pipe directly into the Eno River, at a point about three hundred feet from said factory; that at times said sewer pipe becomes choked and stopped up, and then said deposits of excrement and sewage are run through an open ditch and small drain into said Eno River at about the point of discharge of said sewer pipe above mentioned; that it also maintains in connection with its said closets and system of sewage a manhole or brick chamber, which is just outside of its said factory, which manhole or brick chamber frequently overflows on account of the choked condition of the discharge pipe, and the overflow therefrom is deposited on the ground at and around the manhole, and is washed into the Eno River.

That the defendant also discharges large quantities of dye waste on the ground just outside of its factory, which flows and empties into the river, near the point where defendant's sewer pipe empties.

That said defendant owns about sixty dwelling houses, located on both sides of the said Eno River, and on its watershed, which are occupied by the operatives in defendant's factory, and maintains in connection with said dwelling houses a large number of open privies without a tub system, some of which said privies are within one

hundred feet of the Eno River, and that the fecal matter from said privies is washed by the rains into the Eno River.

That the said city of Durham and its inhabitants are now and have been for the past seventeen or eighteen years supplied with drinking water from a plant which is located on the Eno River at a point a few miles below defendant's said factory; and that the public drinking water supply of Durham and its inhabitants is taken from the Eno River at said plant.

That the city of Durham has demanded of the said defendant that it provide some other method of disposing of its sewage and dye waste, and other dangerous and foul matter, and that it discontinue to empty and discharge the same into the said Eno River, all of which said defendant has refused to do, but on the contrary, wilfully, negligently, unlawfully and in disregard of the comfort, safety and health of the inhabitants of the city of Durham and of the plaintiff T. A. Mann, is flowing and discharging its raw sewage into the Eno River, from which the public drinking water supply of the city of Durham is taken, without having said sewage passed through some well-known system of sewage purification approved by the State Board of Health, or any other system of purification, and has avowed its purpose to continue to do so.

That as plaintiffs are informed and believe, the waters of the Eno River have become and are now being polluted and made unfit for drinking purposes, and that the health of the inhabitants of the city of Durham and of the plaintiff T. A. Mann are seriously menaced because of the acts of the defendant complained of above.

The prayer is for a perpetual injunction. His Honor granted a restraining order with an order to show cause why an injunction to the hearing should not be issued.

The plaintiff in support of the allegations of its complaint filed several affidavits of physicians to the effect that the sewage, dye waste and other deleterious matter, which are discharged into the river from the defendant's premises at Hillsboro, not only pollute the stream at that place, but will, in the opinion of witnesses, pollute it at the place of intake near Durham where the plant of the water works company is located. Affidavits were also filed which tended to show that large quantities of feculent matter and dye waste are daily discharged into the river from the defendant's premises. It is not necessary to set forth the statements of these affidavits more fully, as they are quite sufficient to show that the water of the Eno River at Hillsboro is polluted by the acts of the defendant, and that one of the principal sources of such pollution is the daily deposit in the river of the contents of the defendant's sewer, and this is not only not denied by the defendant, but expressly admitted. One physician, whose affidavit was read by the plaintiff, expressed the opinion that the conditions at the defendant's mill had much to do with the pres-

ence of typhoid fever in Durham and with the impurities found in the water supply of the said city and that, if there should be typhoid fever among the defendant's mill operatives, it is more than probable that it would be communicated to the inhabitants of Durham through the water and cause a serious epidemic, if present conditions are allowed to be continued. No evidence was offered by plaintiff tending to show that an analysis of any kind had been made of the water at the point of the intake near Durham to ascertain if there had been in fact any pollution of the stream at that place.

The defendant, while admitting the pollution of the river at its mill site, near Hillsboro, denies that it extends to the water at the intake of the water company, near Durham. In support of its denial it offers proof of the following facts: The volume of sewage conveyed into the river is very small compared with the volume of water into which it flows. The sewage pipe is only eight inches in diameter and empties eighteen miles above the water company's intake. The excreta are carried through the pipe, by the flushing of the closets with fresh water, to the river two hundred yards distant, and by the time of arrival at the outlet of the sewer the solid matter is practically dissolved. The sewage then passes immediately into the "upper reaches of a pond," which extends one and a half miles below the mill, and there are two other ponds below and four backwaters of former ponds with their dams now broken. There is necessarily sedimentation, which is a means of precipitation recognized by all authorities upon the subject. In the stretch between the defendant's discharge pipe and the intake of the water company are numerous spring branches, creeks and brooks of fresh and pure water, flowing into the Eno River millions of gallons every twenty-four hours. Thus dilution takes place, another recognized means of precipitation. That the flow of sewage is not only small, as already alleged, but is never constant. The dyestuffs are discharged into an open drain at said mills after their coloring matter has been as much as possible removed, and little of the dye makes its way to the river, and not enough to discolor the water, and that none of it, as the defendant is informed, would be injurious to health. That a flowing stream constantly renews from its sources and the accessions from other water courses and the interruptions of the current of this river by ponds and backwaters as described, would give the water polluted at the mouth of the sewer and drain ample time, considering the distance to be traversed, to become chemically and bacteriologically pure before it reaches the intake. The defendant also alleges that while the water company's plant was located on the Eno River before its mill was built near Hillsboro, yet that water was not taken from the stream for the purpose of supplying the city of Durham until three or four years after the defendant began to discharge sewage into the river and otherwise to use its premises as stated in the complaint.

It further avers that the plaintiff could have an abundant supply of pure water from Nancy Rhodes Branch, if the water company had not carelessly and negligently permitted its pond, which is supplied by that branch, to fill, so that the volume of water it could have held was greatly diminished, and that the water company or the city of Durham can easily obtain a sufficient supply of pure water from two or more creeks conveniently located. That a plant for purifying sewage could be erected at defendant's mill only at a great expense and would add nothing to the purity of the water at the intake of the water company, while the water company could, at little expense, rid the water of any impurities which it might gather as it flows and carry along with it to the intake. It is further averred that the water company has not a sufficient settling reservoir at its plant.

There are other matters stated in the affidavits of the respective parties, but it is not necessary that they should be set forth. The presiding Judge made the following finding of facts and the following order thereon:

This cause coming on to be heard by consent in the city of Durham, on the 10th day of February, 1905, and being heard upon the affidavits filed, after argument of counsel, it appears to me from said affidavits filed in the cause:

That the Durham Water Company, a corporation, supplies water to the city of Durham, for the use of its citizens for drinking and other purposes. That the water with which said city of Durham is supplied, for a considerable portion of the year, is taken from the Nancy Rhodes Branch, a tributary of Eno River, but that when the water becomes low, during the summer and other seasons, when there is not much rain, the Nancy Rhodes Branch does not afford a sufficient supply for the needs of the city of Durham and its inhabitants, and on such occasions and for such times the water has been taken from Eno River and conveyed through pipes to the city and used by the inhabitants for drinking and other purposes.

Eno River is a stream some seven miles from the city of Durham; has its source in Orange County, and flows by the town of Hillsboro and the mill settlement of the defendant, the Eno Cotton Mills, which are situated near the town of Hillsboro and close to, some three hundred yards from the river, and about seventeen miles above the intake of water for the plaintiff and the city of Durham.

The defendant, the Eno Cotton Mills, is a corporation and has a large plant near the Eno River, as above set out, in which it employs three hundred or more operatives, and has dwellings on or near the banks of said Eno River for the occupancy of its operatives and their families. That in said mill are closets, for the use of its operatives; that the discharge from said closets is conveyed, in its raw state, through terra-cotta pipes and open drains, into Eno River, and the refuse of dyestuffs from the said mill is emptied out on the ground

and flows and is washed into the river: that the operatives at their dwellings use privies, from which once a week the excrement is hauled off and buried. That the discharge from said mills and the dwellings of said operatives flows into Eno River and pollutes and renders unwholesome the water of the river at the place of discharge of said sewage, and for some distance below said mill.

It further appears, from said affidavits filed, that the pollution of the water of said river, by reason of the discharge from said mills, continues to such an extent down to the intake of the water supply for the city of Durham as to render the water less wholesome, and in case of an epidemic at said mill, such as typhoid fever, would be dangerous to the health of the citizens of Durham using water from said river for drinking purposes.

The defendant has used no precautions to prevent polluting the water of Eno River and does not propose to do so. The Durham Water Company established its plant on Eno River, seven miles from the city, before the defendant constructed its mills or built its plant, but did not use the water of the river for its supply of water to the citizens of Durham until after the defendant built its plant, and had its mill in operation with the same system of sewage and the same method for the disposal of its dyestuffs and the human excrement as now used—with like pollution of the stream.

It further appears from said affidavits that the water now being used by the citizens of Durham is supplied from Nancy Rhodes Branch, and that the flow of said branch in all probability will be sufficient to supply the inhabitants of the city of Durham until the summer months, and that said water is pure, but that when the dry weather comes, and the stream becomes low, the flow of Nancy Rhodes Branch will not be sufficient to supply the city with water, and then the water for such supply will necessarily have to be taken from the Eno River.

It is therefore considered, ordered and adjudged that the restraining order heretofore issued be suspended in its operation until the 20th day of April, 1906, in order that the defendant, in the meantime, may provide some well-known system of sewage purification, to be approved by the State Board of Health.

That from and after the 20th day of April, 1906, the defendant, its agents, servants and employees, under its control, is and shall be restrained from flowing or discharging any sewage into said Eno River until the same shall have passed through some well-known system of sewage purification approved by the State Board of Health and from depositing human excrement and dyestuff, on the watershed of the Eno River at Hillsboro, so near to said river that the same shall flow or be washed into said river, until the final hearing of this action. From this order the defendant appealed.

Fuller & Fuller and R. B. Boone for the plaintiff.

S. M. Gattis, J. W. Graham and Frank Nash for the defendant.

WALKER, J., after stating the case: This is an application for an injunction to restrain the defendant from polluting the Eno River, which, it appears, is in part the source of supply to the city of Durham of water for drinking and other purposes, requiring it to be kept free from impurities. The plaintiffs, although they have stated but one cause of action, base their right to relief upon two grounds: 1. That as the water supply of Durham is obtained partly from the Eno River at a place on that stream where the water company's plant is located, it has the rights in the water of the river of a riparian proprietor. 2. That if this is not so, it has the right to have the defendant enjoined from polluting the waters of the river under the recent act of the General Assembly (Rev., sec. 3951), which reads as follows: "No person or municipality shall flow or discharge sewage into any drain, brook, creek or river from which a public drinking water supply is taken, unless the same shall have been passed through some well-known system of sewage purification approved by the State Board of Health; and the continual flow and discharge of such sewage may be enjoined upon application of any person." This enactment in connection with the fact alleged that the city of Durham actually draws its water supply at a certain season of the year from the Eno River is claimed to confer upon it the right to enjoin any act of the defendant in violation of the statute which tends to contaminate the water of the river at the outlet of its sewer near Hillsboro, where its cotton factory is situated. We will consider these questions in their order.

It is well settled by the authorities that at common law a riparian owner has the right to have the natural stream of water flow by or through his land in its ordinary, natural state, both as to quantity and quality, as incident to the ownership of the land by or through which the water course runs, and that right continues, unless it has been lost or in some degree abridged by adverse user or by grant. This, it must be understood, is not an absolute and unlimited right, but the principle as thus stated should be qualified so as not to interfere with equal rights of other upper and lower proprietors on the same stream. The riparian right, therefore, expressed with greater accuracy, is to have the stream to flow by or through the land in its ordinary purity and quantity, without any unnecessary or unreasonable diminution or pollution of the stream by the owners above. The several proprietors along the course of the stream have no property in the flowing water itself, which is indivisible and not the subject of riparian ownership, but each one may use it as it comes to his land for any purpose to which it can be applied without material injury to the just rights of others. This right to the use of water in its natural flow is not an easement nor is it merely an appurtenance.

but it is something inseparably annexed to the soil itself and exists *jure naturæ* as parcel of the land. We think these principles will be found to be sustained by the authorities upon the subject. Gould on Waters, secs. 204 to 224; *Mason v. Hill*, 5 B. and Ad. 1; *Wood v. Wand*, 3 Exch., 748; *Stockport Water-works Company v. Potter*, 7 H. and N., 160; *Wills, etc., Canal Co. v. Swindon Water-works Company*, L. R. 9, ch. App., 45 (s. c., L. R., 7 H. L., 697); 1 Farnham on Waters, secs. 62 to 65; *Mayor v. Warren Mfg. Co.*, 59 Md., 96. In *Prentice v. Geiger*, 74 N. Y., 345, the doctrine is thus stated: "The use of the water, as it passes, is the only right which, in the nature of things, he (the riparian proprietor) can have in it, and he acquires no exclusive right beyond its actual appropriation. But as all proprietors on the stream have an equal right to the use of the water and to share in the benefits from its use, the right of the several persons is not an absolute, but a qualified one, and the use of each must be such as is consistent with the substantial preservation of the equal rights of others. There are some uses which by common consent a riparian owner may have of the water, as it flows upon his premises, although such use may to some extent interfere with the use of the stream in its natural flow by the proprietors below. As, for example, the proprietor above may use the water for domestic purposes—the watering of cattle and the like—although such use may diminish the volume of the stream to the detriment of lower proprietors. The right to such uses—without which beneficial use of the water by the riparian owner would be prevented—is allowed *ex necessitate*, and is universally recognized."

The Court in *Wills, etc., Canal Co. v. Swindon Water-works Company*, *supra*, says: "All streams, however, are *publici juris*, and all the water flowing down any stream is for the common use of mankind who live on the banks of the stream; and therefore any person living on the banks of the stream has an undoubted right to the use of the water for himself, his family, and his cattle, and all ordinary domestic purposes, such as brewing, washing, and so on. Those are the common purposes of water in the ordinary mode of using water."

The principle is well stated in *Strobel v. Kerr Salt Co.*, 164 N. Y., at page 320, as follows: "A riparian owner is entitled to a reasonable use of the water flowing by his premises as a natural stream, as an incident to his proprietorship of the soil, and to have it transmitted to him without sensible alteration in quality or unreasonable diminution in quantity. While he does not own the running water, he has the right to a reasonable use of it as it passes his land. As all other owners upon the same stream have the same right, the right of no one is absolute, but is qualified by the right of others to have the stream substantially preserved in its natural size, flow and purity, and to protection against material diversion or pollution. This is the common right of all, which must not be interfered with by any. The use

by each must, therefore, be consistent with the rights of others, and the maxim of *sic utere tuo* observed by all. The rule of the ancient common law is still in force: *aqua currit et debet currere, ut currere solebat.*"

After all that can be said, the question is whether the upper riparian proprietor is engaged in a reasonable exercise of his rights to use the stream as it flows by or through his land, whether with or without retaining the water for a time or obstructing temporarily the accustomed flow, and whether he is so doing, as the above authorities show, is a question for the jury under the proper guidance of the Court as to the law applicable to the particular state of facts. *Hayes v. Waldron*, 44 N. H., 580; *Strobel v. Kerr Salt Co.*, *supra*. But in order that this right to have the water of a stream flow with undiminished quantity or unimpaired quality may be successfully asserted, the person who sets up a claim to its enjoyment must show that he is a riparian proprietor or that in some way he has acquired riparian rights in the stream. There is nothing in this case, as now presented, which tends to prove that the plaintiffs are riparian proprietors in respect to the Eno River. They do not allege that the city of Durham is the owner of any part of the banks of that stream, but, on the contrary, the proof tends to show that it is not. The Durham Water Company has a plant abutting on the river and has been using its waters for some years to supply the city of Durham, but that company for some unexplained reason has not been made a party to this suit, nor does it appear even by inference what kind of contract it has with the city for furnishing water. As to all of these matters, we are left without any information. It would seem, therefore, that we cannot proceed to administer relief to the plaintiffs by enjoining the acts of the defendant, if this case is treated simply as one for the suppression of a nuisance, unless we had more definite allegation and proof as to the right of the plaintiffs to maintain this action, without the presence in the record of the water company as a party. We express, though, no decided opinion as to this feature of the case, as we find it unnecessary to do so.

Assuming that the city of Durham is a riparian owner or has riparian rights in the river, we yet think that the plaintiffs' proof falls short of being sufficient for the Court to interpose at this stage of the case a preliminary injunction and restrain the defendant until the hearing from continuing to commit the acts alleged to be injurious to the plaintiffs. If the defendant, being an upper riparian proprietor, and as such entitled to the ordinary use of the water, including the right to apply it in a reasonable manner to domestic uses and even to purposes of trade and manufacture, is using the water of the stream in an unreasonable manner and has defiled the same to such an extent as to constitute an actual invasion of the rights of the plaintiffs, then both are clearly entitled to redress by action of law, and in case

the nuisance be continued, to summary relief by injunction. *Mayor v. Warren Mfg. Co.*, *supra*, and cases cited. Injunction is undoubtedly a proper remedy to prevent the fouling of the water of a running stream by its improper and unreasonable use when prejudicial to the rights of others interested in having the water descend to them in its ordinary natural state of purity. *Goldsmith v. Turnbridge Wells Co.*, L. R. 1, Ch. App., 349, and cases *supra*. But have the plaintiffs made out any such case? They must not only establish that they have a right to be protected, but they must in addition show by satisfactory proof that the right has actually been infringed in some material way or that the defendant is about to commit some act which will tend so far to impair the right as that the damage will be irreparable. "It is a well-settled rule of equity procedure that an injunction to restrain a nuisance will issue only in cases where the fact of nuisance is made out upon determinate and satisfactory evidence. If the evidence is conflicting, and the injury be doubtful, that will constitute a ground for withholding the process. When the interposition by injunction is sought to restrain that which it is apprehended will create a nuisance, the proof must show that the apprehension of material and irreparable injury is well grounded upon a state of facts from which it appears that the danger is real and immediate." *Newark Aqueduct Board v. Passaic*, 45 N. J. Eq., 393; 2 Story Eq. Jur., 924a; *Brookline v. Mackintosh*, 133 Mass., 215; *Attorney-General v. Heishon*, 18 N. J. Eq., 410; 1 High on Injunctions (4 Ed.), secs. 774 and 811; *Crossley v. Lightowler*, L. R. 2, Ch. App., 483. In this case the plaintiffs have not shown by any satisfactory proof, such as the law requires, that the river at the intake of the water company has been polluted. It was an easy matter for the plaintiffs to have the water analyzed at the place where it was drawn into the mains through which it is conveyed into the city, and it appears by the evidence in the case that a chemical and bacteriological analysis could have been made, which would have ascertained with a reasonable degree of certainty at least whether the water had been corrupted at the intake by the sewage and waste material deposited in the stream at the defendant's mill. There is proof on the part of the defendant that there are so many obstructions in the way of the passage of deleterious matter from the site of the mill to the intake and so many natural means presented for the renewal and purification of the stream by the influx of great quantities of fresh and pure water from its tributaries and by sedimentation as to make it improbable, if not impossible, that any deadly germs could "survive the journey" for so many miles between the two points on the river. The only evidence offered in answer to the proof introduced by the defendant and the inference to be fairly drawn from the failure to make a proper analysis to establish the contention which seems sus-

ceptible of demonstration in that way, are the opinions of several physicians and one or two laymen to the effect that the pollution at the outlet of the defendant's sewer will injuriously affect the water at the intake and endanger the health of the citizens of Durham who use the water taken from the river. Opinions of this kind are of the highest value under certain circumstances, but the law requires something more tangible and definite as a basis for seriously interfering with important industrial enterprises. In a case somewhat similar to this, in which just such proof was relied on, the Court said: "Speaking with all possible respect to the scientific gentlemen who have given their evidence, we think that in cases of this nature much more weight is due to the facts which are proved than to the conclusions drawn from scientific investigations. The conclusions to be drawn from scientific investigation are no doubt in such cases of great value in aid of or in explanation or qualification of the facts which are proved, but in our judgment it is upon the facts which are proved, and not upon conclusions, we ought in these cases to rely. In our view, therefore, the scientific evidence ought to be considered as secondary only to the evidence as to the facts." *Goldsmith v. Turnbridge Wells Co.*, 1 Ch. App., 349. That case was reviewed at length and approved in *Newark Aqueduct Board v. Passaic*, *supra*, where a most learned discussion on the subject will be found, and the same may be said of *Mayor v. Warren Mfg. Co.*, *supra*, where Judge Alrey, who delivered the opinion of the Court, states with his usual clearness and force the true principles and grounds upon which the courts proceed in such cases as the one we have under consideration. See, also, *Missouri v. Illinois*, 180 U. S., 208; *Attorney-General v. Mayor*, 45 L. J., 736. The injury here is entirely prospective and it is only possible to form an opinion upon evidence which does not enable us to do more than conjecture whether the apprehension of the plaintiffs is well grounded and free from reasonable doubt. So far as the present state of the proof goes, the jurisdiction of a court of equity is invoked to restrain that which is alleged may, or at the most will, create a nuisance, and not that which in fact does create a nuisance. *Missouri v. Ill.*, 26 Sup. Ct. Rep., 331; *Dorsey v. Allen*, 85 N. C., 358. But if the Court should interfere by injunction, where it is merely probable that a nuisance will result from the acts of the defendant, we do not think the plaintiffs have sufficiently brought their case within the operation of this rule. *Ellison v. Commissioners*, 58 N. C., 57; *Barnes v. Calhoun*, 37 N. C., 199; *Simpson v. Justice*, 43 N. C., 115; *Vickers v. Durham*, 132 N. C., 880; *Dorsey v. Allen*, *supra*; *Stockton v. Railroad*, 56 N. J. Eq., 80. Proof easily accessible to the plaintiffs and which would have established the fact of nuisance beyond any doubt was not produced, but the Court is urged to resort to evidence of a secondary and less satisfactory nature upon which to determine the important rights of the parties.

Under the facts and circumstances, as disclosed by the record, we would have been obliged to reverse the ruling of the Court below and leave the plaintiffs to the necessity of making good their allegation of nuisance at the hearing, in order to entitle themselves to injunctive relief, and this course would be pursued, if we were confined in our investigation of this case to the mere fact of nuisance. But we are not so restricted, as the Legislature has spoken upon the subject of this controversy and it is our duty to give due heed to what it has said. Its declared will is the law and must be enforced, if it has been sufficiently expressed or by fair construction it can be ascertained. The Legislature by chapter 670 of the Laws of 1899 undertook to protect public water supplies from contamination by providing for a thorough system of inspection and the adoption of such sanitary measures as would be likely to contribute to that end. This law contained no provision as to the discharge of sewage into any stream of the State from which a public water supply is taken, but simply related to the subjects of inspection and sanitation. Believing that such a system was not adequate to the full protection of the people of this State from contamination of the water used for drinking and other domestic purposes, the Legislature passed another act, it being chapter 159 of the Laws of 1903, entitled, as the former act, "An Act to Protect Water Supplies." This act contained all the features of the act of 1899 and provided generally in section 1 that water companies should take reasonable precautions to insure the purity of water supplied to the public. It is provided in section 2 that companies which are supplied from lakes, ponds, or small streams not more than fifteen miles in length shall at their own expense have a sanitary inspection of their entire watershed not less than once in every three calendar months and special inspections when circumstances seem to require them. It then directs how the inspection shall be made, namely, by a particular examination of the premises of every inhabitant of the watershed and a search in passing from house to house for dead bodies of animals or the accumulation of filth, excepting uninhabited fields and wooded tracts which are free from suspicion. Where the supply of water is drawn from rivers or large creeks having a minimum daily flow of ten million gallons the provisions of section 2 shall apply only to the fifteen miles of watershed draining into said river or creek next above the intake of the water company. Provision is then made for an inspection by every city or town having a public water supply of its entire watershed, and it is declared to be a misdemeanor to deposit dead animals or human excreta on the watershed of any water supply or to defile, corrupt or pollute any well, spring, drain, branch, brook, creek or other source of public water supply. Then follows section 13 of the act, which is as follows: "No person or municipality shall flow or discharge sewage into any drain, brook, creek or river from which

a public drinking water supply is taken, unless the same shall have been passed through some well-known system of sewage purification approved by the State Board of Health; and the continual flow and discharge of such sewage may be enjoined upon application of any person."

This act has been inserted in the Revisal as chapter 76 and is not materially different as there found from what it was in the original form. The provision in regard to the flowing or discharging of sewage into a stream from which a public water supply is taken seems to be very explicit and susceptible of but one construction. The defendant contends: 1. That section 13 of chapter 159 of the act of 1903, it being section 3051 of the Revisal, applies only to sewers maintained within the distance of fifteen miles above the intake, which is the watershed as defined in the second and third sections of chapter 159 of the act and sections 3045 and 3046 of the Revisal. 2. That if the provision of section 13 is construed to apply to this defendant, whose mill is situated seventeen miles above the intake of the Durham Water Company, then it is unconstitutional and void as being in effect a taking of the defendant's property without condemnation and without compensation; in other words, it is confiscation. We cannot assent to either of these propositions. If we could think that the acts of the defendant are not within the inhibition of that law or that its property is about to be unlawfully taken or interfered with, we would not hesitate to interpose and protect it from such contemplated action. But the meaning of the Legislature is so clear to us and its power thus to legislate is so well established, that we could not so act without plainly disregarding the mandate of the law-making body given in the rightful exercise of its constitutional power. As to the defendant's first contention, it is clear that by the second and third sections of the act the Legislature intended to establish a watershed solely for the purpose of inspection. This is to be deduced from the very language in those sections, and, further, it appears from the manner in which the inspection is required to be made that sewage was not the source of infection or pollution intended to be guarded against by the inspection of the watershed. It is plainly excluded by the very terms of those two sections. At least it so appears to us. But if there could be any doubt as to the true meaning of that part of the act, we think that section 13 (Rev., sec. 3051), which is quoted above, is so broadly worded as to absolutely preclude the construction that the Legislature intended to limit the acts therein prohibited to be done to the watershed of fifteen miles above the intake. We can give to that section no other meaning unless we read into it something that is not there and clearly not intended to be there. The act forbidden is "the flow or discharge of sewage into any river from which a public drinking supply is taken," unless purified as therein provided. It does not confine its opera-

tion to the watershed, but extends to any stream from which water is taken to be supplied to the public for drinking purposes. To limit its scope as suggested would be to defeat the clearly expressed intent of the Legislature, and this we are not permitted to do. We entertain no doubt as to what was intended and we are constrained to hold that the admitted acts of the defendant are within the prohibition of the statute.

The second position is equally untenable. It will be observed by reading the act that it is not required that the sewage discharged into the stream should injuriously affect the water at the intake; it is quite sufficient if it pollutes the water at the sewer's outlet. The Legislature has decided that it is desirable to preserve our natural streams in at least their present state of purity, and where they have been polluted, to remove the cause as speedily and effectually as possible. It has, therefore, said that no person shall deteriorate the water at all by sending sewage into a natural stream until it has been purified and made wholesome or until all the noxious matter in it has been eliminated. And this means, of course, that the water shall not be poisoned by sewage at the outfall. We must assume that the defilement of the water is an injury which is forbidden by the Legislature for perfectly good and sufficient reasons. It is not for us to question the policy or expediency of such an enactment. In this respect the Legislature has a large discretion to be exercised in such way as will in its judgment promote the interests and advance the welfare of the people, and it has this discretion to such an extent as to be virtually a law unto itself so far as the manner of its exercise is concerned. Such legislation is not intended merely to abate an existing nuisance, but to prevent that being done which is a menace to the public health and which it is supposed may become a deadly peril and a public nuisance because fatal in its consequences. It is not, therefore, a void law because it is founded upon mere apprehension of evil, but is a precautionary measure which is clearly within the police power of the State and to be adopted when deemed necessary to secure the public health. We think the general principles we have thus stated will be found clearly stated by *Sir George Jessel*, for the Court, and supported by cogent reasoning in *Attorney-General v. Cockermouth Local Board*, L. R., 18 Eq., 172. That case and this one are not unlike in the facts to which the principle was applied. But a more elaborate treatment of the doctrine in its relation to the police power as its basis will be found in *State v. Wheeler*, 44 N. J. L., 88. The facts in that case were also like those we now have before us in this record. The language of *Judge Magie*, speaking for the Court, would seem to have been uttered with reference to the facts we have here, did we not know it was actually used in another case. Its appositeness must be our apology for quoting copiously from that case. The Court says: "The whole act plainly shows a design to

protect from pollution the waters of creeks, etc., used as the feeders for reservoirs for public use, without any reference as to whether such pollution in fact appreciably affects the waters when arrived at the reservoir. Nor does such a construction render this act objectionable. The design of the act is not to take property for public use, nor does it do so within the meaning of the Constitution. It is intended to restrain and regulate the use of private property so as to protect the common right of all the citizens of the State. Such acts are plainly within the police power of the Legislature, which power is the mere application to the whole community of the maxim, '*sic utere tuo, ut alienum non laedas.*' Nor does such a restraint, although it may interfere with the profitable use of the property by its owner, make it an appropriation to a public use so as to entitle him to compensation. Of the right of the Legislature thus to restrain the use of private property in order to secure the general comfort, health and prosperity of the State, 'no question ever was or, upon acknowledged general principles, ever can be made, so far as natural persons are concerned.' *Redfield, C. J., in Thorpe v. Rutland R. R., 27 Vt., 149.* The same view has been always held in this State, and notably in the case of *State v. Common Pleas of Morris, 7 Vroom, 72.* It was also there held that the extent to which such interference with the injurious use of property may be carried is a matter exclusively for the judgment of the Legislature when not controlled by fundamental law. Nor is there anything to render such legislation objectionable because in some instances it may restrain the profitable use of private property, when such use in fact does not directly injure the public in comfort or health. For to limit such legislation to cases where mutual injury has occurred, would be to deprive it of its most effective force. Its design is preventive, and to be effective it must be able to restrain acts which tend to produce public injury. Many instances of such an exercise of this power can be found. The State regulates the use of property in intoxicating liquors by restraining their sale, not on the ground that each particular sale does injury, for then the sale would be prohibited, but for the reason that their unrestrained sale tends to injure the public morals and comfort. The State is not bound to wait until contagion is communicated from a hospital established in the heart of a city—it may prohibit the establishment of such a hospital there, because it is likely to spread contagion. So the keeping of dangerous explosives and inflammable substances, and the erection of buildings of combustible materials within the limits of a dense population, may be prohibited because of the probability or possibility of public injury. Such instances might be indefinitely multiplied, but these are sufficient to illustrate this case. The object of this legislation is to protect the public comfort and health. For that purpose the Legislature may restrain any use of private property which tends to the injury of those public interests. That the

pollution of the sources of the public water supply does so tend, no one will deny."

We might well content ourselves with stopping here and resting our judgment upon the unanswerable argument there presented, and we would do so but for the great importance of the question and the far-reaching consequences of our decision. The police power, by virtue of which this legislation is vindicated and justified, is no new or unusual exercise of the sovereign will. It has its origin in the most ancient maxims of jurisprudence. All property was originally acquired subject to regulation in its use by those cardinal principles embodied in the maxim, "The safety of the people is the supreme law," and that other maxim, "So use your own as not to injure another." This was the original condition imposed upon the right of property in things, that it should be enjoyed subject to reasonable regulations when considered necessary to promote the general good of society. A good statement of the nature and extent of this police power is to be found in *Thorpe v. Railway Co.*, 27 Vt., 140, where *Redfield, C. J.*, says: "This police power of the State extends to the protection of the lives, limbs, health, comfort and quiet of all persons, and the protection of all property within the State, according to the maxim, *sic utere tuo, et alienum non laedas*, which being of universal application, it must of course be within the range of legislative action to define the mode and manner in which every one may so use his own as not to injure others. There is also the general police power of the State, by which persons and property are subjected to all kinds of restraints and burdens, in order to secure the general comfort, health and prosperity of the State, of the perfect right, in the Legislature, to do which no question ever was, or upon acknowledged general principles ever can be, made, so far as natural persons are concerned. And it is certainly calculated to excite surprise and alarm that the right to do so in regard to railways should be made a serious question. This objection is made generally upon two grounds: 1. That it subjects corporations to virtual destruction by the Legislature; and 2, that it is an attempt to control the obligation of one person to another, in matters of merely private concern. The first point has already been somewhat labored. It is admitted that the essential franchise of a private corporation is recognized by the best authority as private property, and cannot be taken without compensation, even for public use."

He then proceeds to demonstrate conclusively that the police power resides primarily and ultimately in the Legislature, and that private interests of every kind fall legitimately within the range of legislative control, both in regard to natural and artificial persons. "It seems incredible," he says, "how any doubt should have arisen upon the point now before the Court. And it would seem it could not, except for some undefined apprehension, which seems to have pre-

vailed to a considerable extent, that a corporation did possess some more exclusive powers and privileges upon the subject of its business, than a natural person in the same business, with equal power to pursue and to accomplish it, which, I trust, has been sufficiently denied." The general conclusion reached is that there can be no manner of doubt that the Legislature may, if the public good is deemed to demand it—of which it is the judge, its judgment in all doubtful cases being final—require property to be used by persons, as well as their business to be conducted, so as to prevent harm or injury to the public. The same principle is strongly stated in *State v. Common Pleas of Morris*, 36 N. J. L., 72. "While alcoholic stimulants are recognized as property and are entitled to the protection of the law, ownership in them is subject to such restraints as are demanded by the highest considerations of public expediency. Such enactments are regarded as police regulations, established for the prevention of pauperism and crime, for the abatement of nuisances and the promotion of public health and safety. They are a just restraint of an injurious use of property, which the Legislature has authority to impose, and the extent to which such interference may be carried must rest exclusively in legislative wisdom where it is not controlled by fundamental law. It is a settled principle, essential to the right of self-preservation in every organized community, that however absolute may be the owner's title to his property, he holds it under the implied condition that its use shall not work injury to the equal enjoyment and safety of others, who have an equal right to the enjoyment of their property, nor be injurious to the community.' Rights of property are subject to such limitations as are demanded by the common welfare of society, and it is within the range and scope of legislative action to declare what general regulations shall be deemed expedient. If, therefore, the Legislature shall consider the retail of ardent spirits injurious to citizens, or productive of idleness and vice, it may provide for its total suppression. Such inhibition is justified only as a police regulation, and its legality has been recognized in well-considered cases. It is neither in conflict with the power of Congress over subjects within its exclusive jurisdiction, nor with any provisions of our State Constitution, nor with general fundamental principles. Cooley on Cons. Limitations, p. 583, and cases there referred to; *Thurlow v. Massachusetts*, 5 How., 504. It is not necessary to amplify discussion on this point, or to criticise the cases in detail. The view here taken underlies the whole subject of police regulations, and cannot logically be narrowed in its application."

In *Commissioners v. Alger*, 7 Cush., 53, Chief Justice Shaw, referring to the police power says: "This is very different from the right of eminent domain, the right of a government to take and appropriate private property to public use, whenever the public

exigency requires it; which can be done only on condition of providing a reasonable compensation therefor. The power we allude to is rather the police power, the power vested in the Legislature by the Constitution, to make, ordain and establish all manner of wholesome and reasonable laws, statutes and ordinances, either with penalties or without, not repugnant to the Constitution, as they shall judge to be for the good and welfare of the Commonwealth, and of the subjects of the same. It is much easier to perceive and realize the existence and sources of this power than to mark its boundaries, or prescribe limits of its exercise. There are many cases in which such a power is exercised by all well-ordered governments, and where its fitness is so obvious that all well-regulated minds will regard it as reasonable." He then cites numerous instances in which the power can be rightfully exercised, and among them the use of property near inhabited villages in such a way as to produce dangerous exhalations, injurious to health and dangerous to life, and proceeds: "Nor does the prohibition of such noxious use of property, a prohibition imposed because such use would be injurious to the public, although it may diminish the profits of the owner, make it an appropriation to a public use, so as to entitle the owner to compensation. He (the owner) is restrained, not because the public have occasion to make any use of the property, or to make any benefit or profit to themselves from it, but because it would be a noxious use, contrary to the maxim, *sic utere tuo, ut alienum non laedas*. It is not an appropriation of the property to a public use, but the restraint of an injurious private use by the owner, and is therefore not within the principle of property taken under the right of eminent domain." A case directly in point is *State v. Strecker*, 5 N. J. L., 115.

The very contention made in this case that the property of the defendant is taken unlawfully and without due process of law, and that it is denied the equal protection of the laws, thereby violating the fourteenth amendment to the Constitution of the United States, was fully met and answered in *Mugler v. Kansas*, 123 U. S., 623, a leading and authoritative decision upon this question. The Court, by *Harlan, J.*, there says: "Undoubtedly the State, when providing by legislation for the protection of the public health, the public morals or the public safety, is subject to the Constitution of the United States, and may not violate rights secured or guaranteed by that instrument, or interfere with the execution of the powers confided to the General Government. But neither the fourteenth amendment, broad and comprehensive as it is, nor any other amendment, was designed to interfere with the power of the State, sometimes termed its police power, to prescribe regulations to promote the health, peace, morals, education, and good order of the people, and to legislate so as to increase the industries of the State, develop its resources, and add to its wealth and prosperity." He then asks the question, "Who shall

determine whether the particular use of the property is injurious to the public?" and gives this answer: "Power to determine such questions, so as to bind all, must exist somewhere; else society will be at the mercy of the few. Under our system that power is lodged with the legislative branch of the government. It belongs to that department to exert what are known as the police powers of the State, and to determine, primarily, what measures are appropriate or needful for the protection of the public morals, the public health, or the public safety." Summing up and stating the result of all the decisions of that Court, it is further said: "The principle that no person shall be deprived of life, liberty, or property, without due process of law, was embodied in substance in the Constitutions of nearly all, if not all, of the States at the time of the adoption of the fourteenth amendment, and it has never been regarded as incompatible with the principle, equally vital, because essential to the peace and safety of society, that all property in this country is held under the implied obligation that the owner's use of it shall not be injurious to the community. This Court has, nevertheless, with marked distinctness and uniformity, recognized the necessity, growing out of the fundamental conditions of civil society, of upholding State police regulations which were enacted in good faith, and had appropriate and direct connection with that protection of life, health and property which each State owes to her citizens. A prohibition simply upon the use of property for purposes that are declared, by valid legislation, to be injurious to the health, morals, or safety of the community, cannot, in any just sense, be deemed a taking or an appropriation of the property for the public benefit. Such legislation does not disturb the owner in the control or use of his property for lawful purposes, nor restrict his right to dispose of it, but is only a declaration by the State that its use by any one, for certain forbidden purposes, is prejudicial to the public interests."

It was said in *Munn v. Illinois*, 94 U. S., 124, that while power does not exist with the whole people to control rights that are purely and exclusively private, government may require "each citizen to so conduct himself, and to use his own property, as not unnecessarily to injure another. This is the very essence of government; and has found expression in the maxim, *sic utere tuo, ut alienum non laedas*. From this source come the police powers, which, as was said by Chief Justice Taney in the *Licence cases*, 5 How., 583, are nothing more nor less than the powers of government inherent in every sovereignty, that is to say, the power to govern men and things." And again at page 124: "A body politic is a social compact by which the whole people covenants with each citizen, and each citizen with the whole people, that all shall be governed by certain laws for the common good." The same Court said in *Beech Co. v. Massachusetts*, 97 U. S., 32: "If the public safety or the public morals require the dis-

continuance of any manufacture or traffic, the hand of the Legislature cannot be stayed from providing for its discontinuance, by an incidental inconvenience which individuals or corporations may suffer. All rights are held subject to the police power of the State." But the case of *Fertilizer Company v. Hyde Park*, 97 U. S., 659, seems to be directly in point. It involves the validity of an ordinance against conducting an unwholesome business within the corporate limits of the village of Hyde Park, and the plaintiff, who at great expense had erected fertilizer works in the county and transported animal matter through the village, sought to enjoin the enforcement of the ordinance which it claimed would utterly ruin its business. The same contention was made there as here. The Court in *Mugler v. Kansas*, 123, U. S., at page 666, referring to that case and answering the contention, said: "The enforcement of the ordinance in question operated to destroy the business of the company, and seriously to impair the value of its property. As, however, its business had become a nuisance to the community in which it was conducted, producing discomfort and often sickness among large masses of people, the Court maintained the authority of the village, acting under legislative sanction, to protect the public health against such nuisance. It (the Court) said: "We cannot doubt that the police power of the State was applicable and adequate to give an effective remedy. The power belonged to the States when the Federal Constitution was adopted. They did not surrender it, and they all have it now. It extends to the entire property and business within their local jurisdiction. Both are subject to it in all proper cases. It rests upon the fundamental principle that every one shall so use his own as not to wrong and injure another. To regulate and abate nuisances is one of its ordinary functions.'"

Cases might be cited almost without number to sustain the general proposition now being considered. We will refer to several decided in the courts of other States which have a direct bearing upon the question. *State v. Griffin*, 69 N. H., 1; *City of Durango v. Chapman*, 27 Col., 169; *Com. v. Russell*, 172 Pa. St., 506; *Haskell v. New Bedford*, 108 Mass., 208.

This Court has said, in *Brown v. Keener*, 74 N. C., 714: "It is too late to question that the public power of a State (which is a part of the general legislative power) extends to the providing for every object which may be reasonably considered necessary for the public safety, health, good order, or prosperity, and which is not forbidden by some restriction in the State or Federal Constitution, or by some recognized principle of right and justice found in the common law. It is unnecessary to consider at present the limits of this extensive power, since it clearly includes the right to provide for and compel the clearing out not only of such water courses as are naturally navigable, but of all such water courses and drains as are not and

never were navigable, but which are necessary for carrying off the surplus rain water, thereby promoting the public health, and enabling a considerable portion of territory otherwise uninhabitable to be brought into cultivation. *Norfleet v. Cromwell*, 70 N. C., 634; *People v. Mayor of Brooklyn*, 4 N. Y., 440; *Coster v. Tidewater Company*, 18 N. J. Eq., 54; *State v. Blake*, 36 N. J. L., 442; *Reeves v. Treasurer of Wood County*, 8 Ohio St., 343; Cooley on Const. Lim., ch. 16; 2 Dillon on Mun. Corp., sec. 506." Other cases which have been decided by this Court involving in one form or another questions arising out of the exercise of police power are: *State v. Muse*, 20 N. C., 463; *Intendant v. Sorrell*, 46 N. C., 49; *Pool v. Trexler*, 76 N. C., 297; *Norfleet v. Cromwell*, 70 N. C., 634; *State v. Joyner*, 81 N. C., 534; *Winslow v. Winslow*, 95 N. C., 24; *State v. Yopp*, 97 N. C., 477; *State v. Pendergrass*, 106 N. C., 664; *State v. Stovall*, 103 N. C., 416; *State v. Hay*, 126 N. C., 999; *Hutchins v. Durham*, 137 N. C., 68; *State v. McGinnis*, 138 N. C., 724.

It is, of course, no defense that pure and wholesome water can be obtained from other sources than the Eno River. 2 Fanharm on Waters, sec. 515. The fact is that the water supply of Durham is drawn from that stream and that is what protects it under the act from being fouled by sewage. The preservation of the public health was the chief concern of the Legislature, and the purpose of the act was to remove any possible danger which should menace it. Whether the plaintiffs would have any standing in court without the aid of the statute, and if left to depend upon its rights to use the water of the Eno River under its contract with the water company, if it has one, is a question not presented for consideration, and upon it we express no opinion. Our decision must rest solely on the provisions of the statute, which is susceptible of but one meaning, and which declares explicitly that streams used as is the Eno River shall not be polluted, as disease may be communicated to the inhabitants of towns and cities by the use of the water. The fact that the public supply is taken from the stream is sufficient to bring it within the protection of the act, for we must construe the law as it is written and according to its true intent, looking at the evil sought to be remedied and giving it such effect as will not in the least disappoint the will of the people as expressed therein. If any hardship results, it is not from the construction of the law, but from the law itself and the declared policy of the State that the public health must be safeguarded. The welfare of the public is considered in law superior to the interests of individuals, and when there is a conflict between them the latter must give way. *'Necessitas publica major est quam privata.'* As the law is plainly written, so must we decide. The remedy of those who may suffer is by an appeal to the law-making body, who alone can abate the rigor of its enactment.

The judgment must be affirmed, but the Court below may so draw its order as to give the defendant a reasonable opportunity to comply with the statute. The injunction should operate so as to do the least possible injury to the defendant's property and business consistent with the maintenance of the rights and interests of the public.

Affirmed.

SMALLPOX.

During the biennial period just past, the number of cases of smallpox has increased, while the death rate has diminished. The gradual decrease in the death rate during the past four years is quite striking. When we consider the fact that in the last smallpox year, from May 1, 1905, to May 1, 1906, the total number of deaths in 6,049 cases was only 17, or 0.0028 per cent., it is easy to understand the indifference of the people to it and the consequent difficulty in preventing its spread. It has become quite common for people to say that they would rather have smallpox than be vaccinated.

The following is a tabulated statement of our smallpox statistics for the past four years, in order that the reader may make a comparison of this biennial report with the preceding:

	1902-'03	1903-'04	1904-'05	1905-'06
Counties-----	58	65	78	67
Cases:				
White -----	1,861	2,840	3,636	2,798
Colored -----	3,595	2,530	3,739	3,251
Total -----	4,456	5,370	7,375	6,049
Deaths:				
White -----	58	35	13	5
Colored -----	105	34	18	12
Total -----	163	69	21	17
Death rate:	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
White -----	3.12	1.23	0.36	0.0017
Colored -----	4.04	1.34	0.48	0.0036
Average -----	3.60	1.28	0.42	0.0028

From the above it appears that "high-water mark" was reached in 1904-5, with the largest number of cases, 7,375, in the largest number of counties, 78. The death rate, however, has steadily and rapidly diminished, the drop being from 3.60 in 1902-3 to 0.0028 in 1905-6.

The total number of cases of smallpox reported, from the occurrence of the first case in January, 1898, to May 1, 1906, a little over eight years, is: Whites, 13,174, with 190 deaths;

colored, 17,355, with 258 deaths; a grand total of 30,529 cases and 448 deaths, which means that during the eight years $1\frac{1}{2}$ per cent. of the entire population of the State has had small-pox.

COMPULSORY VACCINATION.

In June, 1905, owing to the prevalence of smallpox in a certain township in Washington County, the Sanitary Committee of that county ordered compulsory vaccination, and in addition the closing of the schools in the infected territory unless both teachers and pupils gave evidence of successful vaccination. This was resisted by the County Superintendent of Public Instruction, and the following correspondence, including a decision by the Attorney-General of the State, followed:

PLYMOUTH, N. C., June 5, 1905.

DR. R. H. LEWIS.

DEAR DR. LEWIS:—We have smallpox in one township in our county. The Board of Health has ordered compulsory vaccination in that township and offers free vaccination to whole county; it has also ordered compulsory vaccination in any township in which a case of smallpox occurs, and also that no school, public or private, shall be taught in the county unless the teacher has a certificate of successful vaccination, and no pupil can attend unless a certificate of successful vaccination is presented to the teacher on admission of each pupil. A failure to comply bars teacher from teaching in the county.

Conditions are such that we thought this necessary. Of course, it is all unpopular and I come in for most of the abuse, but don't care. Our Board of Education did not convene until July 3d, when new board goes in and elects new Superintendent, and we could not wait, so Board of Health acted. Now, our Superintendent of Education says I have no right to stop any school, and the fight is on and schools are about to commence.

Please do me the kindness, if we are right, to get Mr. Joyner, Superintendent of Education, to write our Superintendent and make him behave; or, if we are wrong, let me know at your earliest convenience. Please send me the latest copy of our health laws, as I am not sure as to means of enforcing vaccination and what the penalty is. Would be glad if you will explain to me fully, as we will have to make many arrests at first among the negroes and want to proceed beyond any possibility of failure or weakening, as the necessity is great.

Very respectfully,

W. H. WARD, M. D.,
Superintendent of Health.

RALEIGH, June 6, 1905.

MR. J. Y. JOYNER,

Superintendent Public Instruction, Raleigh, N. C.

MY DEAR SIR:—I enclose a letter just received from the Superintendent of Health of Washington County, which explains itself. I also enclose a copy of an act relating to the Board of Health, as amended.

I think it is clear that under this law the County Sanitary Committee, if in their judgment it is necessary, to protect the public health, have the right to close the schools, both public and private, as well as to prevent any public gatherings. It is so eminently reasonable, when you think of how contagious diseases, such as smallpox, are spread, that I do not suppose any man who thinks seriously about the subject would attempt to controvert it.

If you agree with me I would be glad if you would write to the Superintendent of Instruction of Washington County asking him, instead of opposing the efforts to prevent the spread of this loathsome disease, to lend his aid in forwarding the measures to get the people protected by vaccination.

Very truly yours,

RICHARD H. LEWIS, M. D.,

Secretary.

OFFICE OF SUPERINTENDENT PUBLIC INSTRUCTION,

RALEIGH, June 13, 1905.

DR. R. H. LEWIS,

Raleigh, N. C.

DEAR SIR:—I beg to acknowledge the receipt of your letter of June the 6th. My absence from the office has prevented an earlier reply to the same. I have deemed it wisest to refer the matter to the Attorney-General for his official opinion before writing to the County Superintendent. I shall act in accordance with the opinion of the Attorney-General, so as to be sure of my ground before acting.

Very truly yours,

J. Y. JOYNER,

Superintendent Public Instruction.

OFFICE OF SUPERINTENDENT PUBLIC INSTRUCTION,

RALEIGH, June 23, 1905.

DR. R. H. LEWIS,

Raleigh, N. C.

DEAR SIR:—I beg to enclose copy of the opinion of the Attorney-General in regard to the enforcement of compulsory vaccination in Washington County, and to say that I have just written to the County Superintendent, enclosing a copy of the opinion, and advising that the law be obeyed without resistance.

Very truly yours,

J. Y. JOYNER,

Superintendent Public Instruction.

WAYNESVILLE, N. C., June 15, 1905.

HON. J. Y. JOYNER,

Superintendent Public Instruction, Raleigh, N. C.

DEAR SIR:—I have the honor to acknowledge the receipt of your favor of the 13th inst., with enclosures, in the matter of the power of the Board of Health of the county of Washington to order compulsory vaccination in a certain township in that county where the presence of smallpox exists or is suspected. In reply I beg to submit the following:

Chapter 214, Laws 1893, as amended, is an act relating to the Board of Health. The Supreme Court of North Carolina has said that it "is a well-considered and carefully drawn statute for the preservation of the public health." Section 22 thereof, entitled "Vaccination," contains the following language: "* * * the Sanitary Committee of any county may make such regulations and provisions for the vaccination of its inhabitants and impose such penalties as they may deem necessary to protect the public health."

The public safety is the highest law, and the preservation of the public health has always been considered a proper field for the exercise of the police power.

In *State v. Hay*, 126 N. C., 999, the Supreme Court of this State uses the following language: "The highest medical authorities, confirmed by long experience of mankind, attest the efficacy of vaccination as a preventive or alleviative of a most dreadful disease—smallpox"—and expressly decides that the authorities of a county or town may make regulations and provisions for the vaccination of the inhabitants, and enforce them by penalties.

In view of this decision of the Supreme Court of our State, which is recognized as the law of the land by Cooley in his *Constitutional Limitations*, 7th Ed., p. 880, and the common observation of mankind, it seems a little strange that there should be any resistance to the enforcement of so salutary a law—a law designed to suppress the spread of a deadly pestilence that walketh at noonday.

I am clearly of the opinion that the Board of Health of the county of Washington possesses the power to order compulsory vaccination in any township where smallpox exists.

Very truly yours,

ROBERT D. GILMER,
Attorney-General.

TYPHOID FEVER AT ELIZABETH COLLEGE, CHARLOTTE.

MINUTES.

At a joint conference of Dr. C. S. McLaughlin, Superintendent of Health for Mecklenburg County, and Dr. F. O. Hawley, City Physician and Health Officer, Charlotte, and Dr. C. A. Misenheimer, Physician for Elizabeth College, and D. A. Tompkins, Consulting Engineer, the following points were agreed upon:

1. That in order to assure patrons of the college of the safety of the college in health matters, an investigation be immediately made by a well-known sanitary engineer.

2. That the State Board of Health be asked to send a representative here to assist in this work.

3. That the State Board of Health be requested to ask the health authorities of the United States Government to send a representative expert here to assist in this work.

4. The purpose is not alone to find cause of the fever, but to get such sanction of report as will carry the fullest conviction everywhere and immediately.

(Signed) C. S. McLAUGHLIN, M. D.,
Superintendent of Health.

F. O. HAWLEY,
City Physician and Health Officer.

C. A. MISENHEIMER,
College Physician.

D. A. TOMPKINS,
Consulting Engineer.

REPORT OF PASSED ASSISTANT SURGEON JOHN F. ANDERSON, UNITED STATES PUBLIC HEALTH AND MARINE HOSPITAL SERVICE.

SURGEON-GENERAL U. S. PUBLIC HEALTH AND
MARINE HOSPITAL SERVICE.
Washington, D. C.

SIR:—I have the honor to submit the following report, in accordance with instructions contained in Bureau letter of July 2, 1906, directing me to proceed to Charlotte, N. C., and investigate an outbreak of typhoid fever in that city.

Upon arrival in Charlotte, in obedience with my instructions, I called upon Dr. Hawley, the City Physician, but was informed by him that the proposed investigation was not on account of typhoid fever in the city of Charlotte, but on account of an outbreak of fever in Elizabeth College, situated in the environs of the city. I there met the principal of the school, the school physician and two members of the board of trustees, and Mr. W. W. Locke, of the Metropolitan Water Board, Boston, Mass., who had been engaged by the school to investigate the outbreak of fever in Elizabeth College.

This College is situated on one of the hills by which the city is partly surrounded. The College buildings were erected in 1899, and so far as I was able to learn, modern ideas in regard to construction, plumbing, etc., were employed. The dining-room, kitchen and other rooms where food is kept are well screened from flies and kept clean. The water supply is from the city mains. The milk supply up to April 19th was from cows kept at the school, but from that date until the close of the school, May 22d, an additional supply was obtained from the Watkins dairy, from two to three gallons being received daily. Ice cream was obtained at various times from Brannan, a dealer in Charlotte. Brannan obtained his milk supply from Dotger and Kirkpatrick's dairies.

Elizabeth College had during the past session 180 pupils and teachers; of these, 92 boarded in the College. Dr. King, the principal, had eight in his family; he lived in a separate house and had the same water, ice and food, though his meals were prepared in his own house, with the exception of the Watkins milk, as the school. There were 24 servants employed in the buildings.

From the 10th to the 20th of May the school physician reports thirty-three cases of typhoid fever among the pupils and teachers; from the infirmary record I think we can be sure that seventeen only were genuine typhoid, the other cases having a duration of less than a week, some as short as four days. No case occurred in the principal's family and none among the servants, who were all negroes. So far as could be determined, none of the day scholars, about eighty in number, developed typhoid during the time.

In the city of Charlotte there is considerable typhoid fever; just how much I am not able to say, as there are no requirements compelling the reporting of typhoid fever. Fifty cases were reported for the month of June, and thirty-eight cases were reported under treatment during the week ending July 4th, but I think double this number would not be far out of the way.

Two main causes operate for the prevalence of typhoid fever in the city itself: 1. The city water supply. 2. The large number of wells.

I made no attempt to investigate the second cause, but paid considerable attention to the city water supply. This supply is derived

from a watershed about five miles square; the water from the shed is collected in a reservoir, where partial sedimentation takes place, and is passed through a mechanical filter, thence pumped into a standpipe, and from there distributed through the city. There are about forty families living on the watershed. Three dairies, containing about one hundred cows, are also on the watershed. At the present time there are two undoubted cases of typhoid fever, and possibly a third one convalescent, among those living on the watershed. One of these cases, which I saw, was within a mile of the reservoir.

The flow of water into the reservoir is very rapid, resulting in the quick washing by rain of material deposited on the ground into the reservoir. These cases of typhoid fever on the watershed are a serious menace to the city water supply, and some means should be found to bring about their removal.

The water after passing through the filtration plant is almost colorless, but recent examination of it by Penniman and Browne, of Baltimore, Md., shows the presence of *B. coli*.

There are no proper examinations made of the raw and filtered water so that it can be determined just what the plant is doing. It is plain that there is no scientific control of the filtration system, without which no filtration system can give satisfactory results.

Other than the two main sources of infection in the city are the ice, milk, contacts, flies, fresh vegetables, and fruits, such as berries. Up to June 1st the ice plant obtained its water from an abandoned mine shaft, which is so situated as to receive the drainage of a number of houses and factories. The manager of the ice plant claims that all the water used for making ice is distilled, but it has been my experience with ice manufacturers that at times, when the supply of distilled water runs low, plain water is also used.

There are many dairies supplying milk in the city. Time did not permit me to visit all of them. I visited Watkins', Dotger's and Culp's. The water at Watkins' dairy is from a spring, or a number of springs; two families reside near this spring and it would be easy for surface drainage to get into it. As the additional source of milk supply for Elizabeth College, which was first obtained April 19th from this dairy, I examined into its methods, water, and general conditions at some length. I was unable to learn of any case of sickness among the employees or persons living on the farm, but information on this subject was not freely given—in fact, refused. So far as I was able to learn, it was not the custom to sterilize the returned milk cans and bottles; they were simply washed out with warm water and soap and then rinsed out with cold water, which was obtained from a well of the spring water outside the washing room or from the troughs in which the milk cans are kept in the washing room. This last practice seems to me to be particularly per-

nicious, for, if a returned milk bottle from a house in which there was typhoid fever should be infected by any means, it would be possible to rinse this bottle in the bucket which was used to dip up the water to infect many other bottles and the water in the troughs or well of spring water. It certainly would seem that all milk cans and bottles should be sterilized before being used a second time.

A visit was made to what is known as the "Upper Watkins farm," which supplies part of the Watkins milk. The water supply here is a surface well, about fifteen feet deep; near the well is a negro cabin, in which at the time of my visit was a child who had been sick several days—clinically the case seemed to be typhoid fever. There was no privy and the dejects could easily drain into the shallow well. The well supplied water for washing the cans and cooling the milk.

In view of the fact that the College first began to get milk from the Watkins dairy on April 19th. or just twenty-one days before the first case of fever developed there, and that no case occurred in the principal's family, who had the same water and food supply, but not the milk from this dairy, I am inclined to regard the Watkins dairy milk as a very probable source of infection for the College.

Moreover, the Presbyterian College for Women had 112 boarding pupils who used the same water supply as Elizabeth College but a different milk supply, and, except for one case of typhoid fever, which from the history probably did not originate in Charlotte, had no fever this spring. This probably excludes the city water as the cause of the outbreak of seventeen cases in Elizabeth College.

A rather general impression prevailed in certain quarters that the plumbing of the College was the cause of the fever, but it is generally accepted among sanitarians that defective plumbing of itself cannot cause typhoid fever; besides, I consider the plumbing in good condition and believe that it had nothing to do with the outbreak of fever.

A partial chemical examination was made by Dr. Kastle, Chief Division of Chemistry, of the filtered city water and of the water from the tap in the cooling room at Watkins' dairy. This examination, in connection with the bacteriological examination, shows that the city water is bad. The chlorine, nitrates and nitrites of the Watkins water are high and the water, chemically as well as bacteriologically, is unfit for drinking purposes.

BACTERIOLOGICAL EXAMINATION.

Samples of water were taken from various places, placed on ice and brought to the Hygienic Laboratory for study. The samples were taken from places which appeared to have more or less connection with the outbreak in Elizabeth College. Thirteen samples in all were taken from the following places:

No. 1. City tap water, Elizabeth College. No. 2. Tap in cooling room at Watkins' dairy. No. 3. Well of spring water outside washing room, Watkins' dairy. No. 4. Trough for milk cans in washing room, Watkins' dairy. No. 5. Well water, Culp's farm. No. 6. Well water, Dotger's dairy. No. 7. Well water, Lower Watkins farm. No. 8. Mine shaft near ice factory. Nos. 9, 10 and 11. Filtered water, filtration plant. No. 12. Raw or unfiltered city water. No. 13. City water at Dr. Bland's house.

Samples Nos. 3, 4 and 10 were not studied in detail, as other samples from practically the same source were.

Sample Number.	Source of Water.	Number Bacteria per Cubic Centimeter.	Minimum Quantity Producing Gas in Lactose Bouill at 42° C.	Presumptive Test for B. Coli.	Diagnostic Tests for B. Coli.						
					Morphology.	Motility.	Gelatine Liquefaction.	Gas in Lactos Broth.	Milk Coagulation and Acid Produced.	Indol Test.	Notrates Reduced.
1.	City water, Elizabeth College	100	Cubic Centimeters. 1.0	x	Rod	Slight	---	x	x	x	Yes.
2	Tap in cooling room, Watkins' dairy	1,800	0.1	x	Rod	Slight	---	x	x	x	Yes.
3	Well of spring water, Watkins' dairy	7,000	0.1	x							
4	Trough for milk cans, Watkins' dairy	9,000	0.1	x							
5	Well at Dotger's dairy	100	10.0	x	Rod	Slight	---	x	x	x	Yes.
6	Well at Culp's dairy	40	10.0	x	Rod	Slight	x	x	x	x	(?)
7	Well at lower Watkins farm	12,000	0.1	x	Rod	Slight	---	x	x	x	Yes.
8	Old mine shaft near ice plant	8,000	0.1	x	Rod	Slight	---	x	x	x	Yes.
9	Filtered water gallery, filtration plant	800	1.0	x	Rod	Slight	---	x	x	x	Yes.
10	do	700	1.0	x	Rod	Slight	---	x	x	x	Yes.
11	do		1.0	x							
12	Unfiltered city water	6,000	0.1	x	Rod	Slight	---	x	x	x	Yes.
13	City tap water, Dr. Bland's house	100	10.0	x	Rod	Slight	---	x	x	x	Yes.

An examination of the foregoing table shows that the colon bacillus was isolated in pure cultures from all of the samples studied, except No. 6, which was doubtful. All of the samples showed the "presumptive test for *B. coli*." Samples of city water showed *B. coli* in as small as 1 cubic centimeter; the filtered city water in 0.1 cubic centimeter.

All the samples from Watkins' dairy spring-water well and from the well at the lower farm showed *B. coli* in as small amounts as 0.1 cubic centimeter. The Culp and Dotger water showed *B. coli* in 10 cubic centimeters.

CONCLUSIONS.

From the foregoing the following conclusions may be drawn:

1. That an efficient daily patrol of the watershed should be made in order to detect cases of illness, especially typhoid fever.

2. Some means should be provided by which all cases of typhoid fever occurring on the watershed could be removed, so as to no longer be a source of danger to the city water supply.

3. Practically the entire water supply of the city of Charlotte is infected.

4. The filtration plant only removes about 88 per cent. of the bacteria.

5. The filtration plant is conducted in an unscientific and faulty manner.

6. There is urgent need of a competent biologist and chemist to make a thorough study of the wells used for drinking water in the city of Charlotte.

7. A daily examination of the raw and filtered water should be made.

8. All infected or suspicious wells and springs should be closed against use for all purposes.

9. The ice factory should be prohibited from using water from the old mine shaft.

10. On account of the fact that the water of certain dairies was found to contain colon bacilli, dairymen should be required to sterilize all milk cans and bottles before being used for fresh milk.

11. On account of the great lapse of time, it is impossible to say definitely where the infection of the seventeen cases at Elizabeth College originated; but it is very probable in the additional supply of milk which was first used at the College twenty-one days before the outbreak of the fever.

12. Elizabeth College should have a sufficient number of cows to supply milk for all its purposes.

13. All the water used for drinking purposes in the College should be boiled.

14. No ice used at the College should be put in the water or milk; these articles can be cooled by being put on the ice or in some other satisfactory manner.

15. In my opinion, the outbreak of fever at Elizabeth College was not due to defective plumbing, as some claimed, nor was it due to any negligence on the part of the College authorities, and could not have been avoided without biological examination of the College supplies.

Respectfully,

(Signed) JOHN F. ANDERSON.

Passed Asst. Surg. and Asst. Director of the Hygienic Laboratory.

Respectfully forwarded:

(Signed) M. J. ROSENAU,

Director Hygienic Laboratory.

REPORT OF MR. WILLIAM W. LOCKE, SANITARY ENGINEER.

TO CHARLES B. KING,

*President, and the Trustees of Elizabeth College and
Conservatory of Music for Women, Charlotte, N. C.*

GENTLEMEN:—On June 30, 1906, I received a telegram from Dr. C. A. Misenheimer to come to Charlotte and investigate an epidemic of typhoid fever at Elizabeth College.

I arrived at Charlotte at 9:30 A. M., July 3d, and entered at once upon the investigation. Dr. R. H. Lewis, Secretary of the State Board of Health of North Carolina, arrived an hour later. He spent the remainder of the day with me in ascertaining as far as possible the facts leading up to the epidemic. He also telegraphed to Washington for a man, and Passed Asst. Surg. John F. Anderson, of the United States Public Health and Marine Hospital Service, came on the morning of July 4th. With Dr. Anderson a systematic investigation was begun, but we found in the beginning that we were handicapped by the length of time which had elapsed since the outbreak of the epidemic and the time of beginning the investigation. The facts regarding the epidemic, as nearly as we could ascertain, were as follows:

Elizabeth College had 180 pupils, of whom 100 were day students and 80 boarded and lived in the College. There were also 12 teachers who lived on the premises, making 92 who boarded at the College table. On May 13, 1906, there were five or six cases of illness which seemed to develop simultaneously. These were followed in rapid succession by other cases. The college year ended on May 22d, and a few cases were reported as developing in the homes of the students, so that the total number reported were thirty-one or thirty-two. The College physician was inclined to call all of these cases typhoid fever, but after a careful inquiry, both from him and the head nurse in charge, I am of the opinion that probably not over seventeen of the

cases were really typhoid. Eight of these were acute and there were two deaths.

In studying the history of this outbreak it was interesting to note that all of the cases were confined to those living at the College, both teachers and students being afflicted, but among the twenty-four servants who also lived at the College not one case developed. Neither was there any sickness in Dr. King's family, consisting of nine persons, who reside in the College yard. There are no wells anywhere upon the premises, the water supply for the College, Dr. King's residence and the barns coming from the city mains. The College dairy furnished all of the milk supply to every one residing within the College yard until April 19, 1906, when additional milk from McD. Watkins was taken, and outside milk was bought from this date until May 30, from one gallon to three and one-half gallons per day being purchased. This outside milk was used both by the servants and those boarding at the College, but not by Dr. King's family, he continuing to use only the milk from the College dairy. Of those who were sick, probably at least six did not drink raw milk, while some who were not sick were inveterate milk drinkers. Some of the ice cream eaten at the College was made from milk produced on the premises and some was made from milk furnished by outside dairymen, but most of the cream was purchased. All of those who were sick ate ice cream, and this led us to investigate the dairies of those men who furnished milk to the ice-cream man.

The investigation included the ice and water supplies of the city, the cases of typhoid in the city, McD. Watkins', Dotger's and Culp's dairies, and Elizabeth College. For convenience I have divided the report into the following heads:

1. Ice supply.
2. Water supply.
3. Typhoid in the city.
4. Milk supplies.
5. Elizabeth College.

1. *Ice Supply.*—It is a habit in Charlotte, as it is in many places, to put ice for cooling purposes directly into the milk and drinking water. I understand that all the ice supplied to the city is manufactured by a local concern which drew practically all of its water supply from August 1, 1905, to June 1, 1906, from an abandoned shaft of a gold mine. The superintendent of the City Water Works informed us that the ice company did not use water enough to make it worth while to present it with a bill during that period, and that the plant was running at its normal capacity during those months. An examination of this abandoned shaft showed that it was 50 feet deep, the water being unusually clear and cold. The superintendent of the plant told me that all of the water used in the manufacture of ice was distilled before being frozen, but he also told me that it was an unusually pure water and perfectly safe to drink. The evaporation

of water and its condensation and freezing cost considerable money. It is certainly a fair inference to suppose that this company is operating its plant as economically as possible, and consequently at least *some* of the water was not distilled before being frozen. Upon the watershed directly above this shaft are many dwellings and factories, and from 125 to 500 feet from it there are from fifteen to twenty dwelling-houses occupied by negroes. All of the drainage coming from this area and from the ice plant itself flows in a ravine within fifty feet of the shaft, the embankment separating the two being the débris thrown out of the shaft.

2. *Water Supply.*—The city water supply is taken from Irwin Creek, which is a small brook located close to Charlotte. A dam was built last year within two miles of the city which caused about twelve acres of farm and pasture land to be flooded. This area was not stripped, nothing being done in preparation for the reservoir except to remove trees and brush, leaving the stumps. The capacity of this reservoir is about 75,000,000 gallons. The area tributary to it has not been surveyed, but the superintendent says it contains about five square miles, being three miles along the course of the brook and approximately two miles wide at the widest part. The slopes are quite steep, causing what is known as a "quick" watershed. Water falling at the upper end of the watershed during a heavy shower will reach the reservoir in about two hours. The soil is a red clay which is nearly impervious to water. Upon this watershed there are about forty houses with a population of about 200 people, 100 cows, 40 to 50 horses and mules, and 40 pigs.

At the present time there are only three large dairies: that owned by Mr. Howland, which contains 30 cows, being the only one very close to running water. The location of Mr. Howland's barn and yards are such that all of the wash from them must run very quickly into the water supply.

There have been at least three cases of typhoid fever upon this watershed during the present year. Two of the cases had recovered at the time of our visit: but one, a negro girl three years old, was still very sick, her mother stating that she took to her bed on June 12th. This family lives in a house on a knoll between two ravines, near the headwaters of the supply. A spring about 100 feet from the house is used as its water supply and it is also the headwaters of one of the feeders. The slope to the brook from the house is quite steep. All the slops from this house except the dejecta from the sick patient were being thrown out into the yard, there being no sinks or other sanitary arrangements in the house. The dejecta were being placed in a shallow pit under the direction of the water-works superintendent. At times of heavy showers any organic matter lying upon the surface must be washed directly into the stream.

The water in the storage reservoir is always quite muddy, and especially so after showers. To remove this mud, the water is car-

ried by a pipe to a pump well at the pumping station, where it is treated with sulphate of aluminum and then pumped to the settling reservoir, and from there it is carried by gravity to a series of ten mechanical filters, where it is passed through four feet of clean sharp sand on its way to the pure-water reservoir. From this reservoir it is pumped to the city standpipe and from there it runs by gravity through mains to the consumers. We found that the application of this alum was by guesswork, as the engineer was putting in what he guessed was a sufficient quantity to obtain a clear effluent. The average quantity of alum used is about 1.2 grains per gallon, which means 300 pounds per day for 1,750,000 gallons. The action of alum is not only to precipitate the mud, but also to throw down and destroy any organisms that may be in the water.

3. *Typhoid in the City.*—Soon after arriving in Charlotte, I heard statements that there were many cases of typhoid in the city and that fifty cases had been reported in June. I went to the City Physician's office to get a list of the cases, but found that the doctors had not been required to report them. A meeting of the physicians was then called, which was well attended and at which Dr. Anderson and I explained why we needed the data and asked for all cases occurring after April 1, 1906. The physicians expressed a willingness to comply with our request, blanks were furnished them which they were to fill out, and as a result forty cases were reported, but all of these patients were sick on July 5, 1906.

It is probable that at least one hundred cases had actually occurred from April 1st up to this date, and if all of them could have been located, cases might have been found which would have indicated that they were the starting points of the infection. I have plotted the forty cases reported upon the accompanying map. You will see that they are scattered quite evenly throughout the whole city, and apparently there was no common source of infection.

From the best information obtainable the following table, showing the sources of milk and water supply, was made up:

Milk.		Water.			
Name.	Cases.	City.	Well.	Both City and Well.	Spring and City.
Watkins -----	3	1	1		1
Dotger -----	1	1			
Trotter -----	1	1			
Moore -----	1		1		
Mrs. Davis -----	1		1		
Mrs. Houston -----	2			2	
Mrs. Reigler -----	1	1			
Unknown -----	30	1			
Total -----	40				

WATER.

City	13
Wells	18
Both city and well.....	8
Spring and city.....	1
Total	40

The data regarding the milk supply was so meager that no conclusions can be drawn from it, but that regarding the water is very interesting and shows that there are probably many infected wells in the city as well as an impure public water supply.

4. *Milk Supply.*—The dairies inspected were owned by McD. Watkins, Dotger, and Culp. Mr. Watkins milks about 100 cows, having them divided between two dairies. At his upper dairy he gets all of his water supply from a large continuously flowing spring, which is located just above his cow barns. There are two houses occupied by employees and containing about fourteen people just above and very close to this spring. The water is piped to concrete troughs, in which the milk cans are kept in the washing room, to a concrete well where water is dipped out for washing and rinsing purposes, and to the cooling house where the milk is chilled before being bottled. The temperature of this water is about 60 degrees as it comes from the spring, and no ice is used to chill the milk further. The milk cans and bottles were being washed in lukewarm water and rinsed in spring water. Mr. Watkins said that it was the custom to rinse the cans with clean spring water. Perhaps this is true when he is present to see that it is done, but we saw the negro doing the washing dip water from the concrete trough, which contained dirty water

standing from the day before, and pour it in his rinsing pan. It is the habit of the negro to do the thing that is the easiest, and in this case it was much more convenient to dip water out of the concrete trough than it was to get it from the concrete well. Immediately below the barn is a large pig-pen, the drainage from which and from the rinsing of the bottles runs into a low place where some cows were drinking and wallowing about.

At Mr. Watkins' lower dairy the water supply comes from a well about twenty feet deep, the water being elevated by two buckets and a rope operated over a wheel. Within 60 feet of the well is a house occupied by a family of negroes, one of the children being sick with fever at the time of our inspection. His mother said he had been sick for over a week. There were no sanitary arrangements provided for this house, the yard being used for a privy. This well supplied water for washing the cans and cooling the milk.

Mr. Dotger furnishes the ice-cream man with practically all of his milk, supplementing his own supply with that of his neighbor, Mr. Culp. The two milk about eighty-three cows. Mr. Dotger washes all of the milk cans for both farms. His house where the milk is bottled is located very close to his well and all of the wash water runs upon the surface within six feet of this well and disappears. It is a pipe well, 86 feet deep. The cans were actually being scalded while we were there, but they are always rinsed with cold water before being filled again with milk.

5. *Elizabeth College*.—The opinion frequently expressed to me by city officials and others was that the trouble at Elizabeth College originated from defective plumbing; and as a great many people, including many physicians, believed that most of these cases came from this cause, it may be well to state briefly the nature and causes of typhoid fever.

"Typhoid fever is so called because it resembles, and was not formerly distinguishable from, typhus fever, otherwise known as 'ship,' 'jail,' or 'spotted' fever. It is characterized by slow and insidious onset during a period lasting for about two weeks, during which the patient generally suffers from severe frontal headache, often having in addition backache, nosebleed, diarrhea and a general loss of strength, which finally, in severe cases, compels him to take to his bed. By this time active fever is well established, the temperature ranging from 100 to 105 degrees or even higher, and characterized by a daily rise in the evening and a fall in the morning.

"During the period of active sickness, which usually lasts from four to eight weeks, delirium sometimes occurs, and other serious symptoms make their appearance. It is a characteristic of the disease, and one which distinguishes it from typhus fever, that in typhoid fever the small intestines undergo more or less extensive and dangerous ulcerations; and inasmuch as these ulcers burrow

into the wall of the intestinal tube they may either perforate it, allowing fecal matters to enter the peritoneal cavity and causing speedy death from septicemia, or they may involve important blood vessels, which, becoming disintegrated, cause profuse hemorrhages, often likewise followed by speedy death.

"Owing to the fact that the lower animals are not, so far as known, susceptible to typhoid fever, it has never been possible as yet to establish with absolute certainty the identity of the specific germ of typhoid fever. At the same time there is a very general agreement that the so-called Koch-Eberth-Gaffky bacillus is, in all probability, the real and specific cause of the disease. The commonly accepted theory of the causation of typhoid fever is that the specific bacilli, making their way into the alimentary canal in such vehicles as water, milk, dirt or dust, survive the journey through the stomach, and finding themselves in the intestines there multiply and produce their own specific toxin, to the absorption of which are due the earlier symptoms of the disease. Simultaneously, or possibly subsequently, and presumably under the action of the same toxin, the guardian membranes of the alimentary tract are weakened or otherwise damaged, so that their usual resistance is somewhat enfeebled, and the bacilli make their way through them into the tissues of the body proper. Of all the tissues the spleen seems to be particularly affected, and it is from this organ that those bacilli are most easily recovered which are believed to be specific and characteristic of the disease. If these commonly accepted ideas are correct, it is obvious that the bowel discharges of typhoid fever patients must naturally contain large numbers of germs of typhoid fever; and that if these discharges find their way into sewage, such sewage must be not only polluted with the ordinary bowel discharges, but also actually infected with the specific germs of the disease. Furthermore, if this sewage happens to find its way into a water supply, that supply is liable to become a vehicle of disease unless it shall somehow have been purified before it is used for drinking purposes. It should also be observed in passing that the journey from one human intestine to another may, conceivably at least, be very short, very direct and very quick; and it is also easy to understand that the virulence of the germs may well depend upon various conditions to which they have been submitted en route.

"In the case of typhoid fever it was until recently very difficult to demonstrate with certainty the presence of typhoid-fever bacilli in the bowel discharges of patients suffering from that disease, so that we were actually in the humiliating position of attributing to these discharges the principal agency in the distribution of typhoid fever, while yet we were quite unable satisfactorily to prove the presence of the germs in the discharges. From this unfortunate dilemma we seemed to have been relieved by the Widal serum test, so that at present it is held to be easy to make the demonstration so desirable.

"It is commonly believed that much sickness is directly caused by the emanation of gases from sewers, drains, cesspools and other receptacles for sewage and similar foul or decomposing substances. This belief even goes so far popularly and sometimes professionally as to serve as the all-sufficient explanation for the occurrence of certain specific diseases, such as typhoid fever, dysentery, diphtheria and scarlet fever.

"Closely examined, the belief in the efficiency of sewer gas as the cause not only of general, but also of specific, disease appears to rest upon the idea that in some way or other poisonous gases, after having been formed in sewers, cesspools and the like by active decomposition of the foul substances therein, escape into the air, and being inhaled, either by virtue of their chemical character or by means of micro-organisms, for which they are a vehicle, produce insidious general poisoning or specific disease. It is very seldom, however, that the sewer-gas theory of disease is thus explicitly and clearly defined. More often it takes the form of the simple statement or belief that typhoid fever, dysentery, diphtheria or malaria are directly produced by broken drains; and it is this form chiefly of the theory or belief which requires to be corrected.

"The facts with regard to sewer gas and the part which it plays in the causing of disease appear at present to be as follows:

"In the first place, there is reason to believe that the dangers of sewer gas have been very much exaggerated. There is no doubt, of course, that sewage is a decomposing liquid, and that it may and often does contain the germs of specific diseases. But, on the other hand, the facts that workmen frequently spend much of their time in sewers with impunity, or work upon or about sewage in sewage-purification works or on sewage farms, seem to show that experience does not confirm the idea that the gases emanating from sewage are always or necessarily dangerous. Furthermore, careful chemical and bacteriological examinations of the air of sewers have shown not only that dangerous gases cannot ordinarily be detected in such air, but even that sewer air is singularly free from micro-organisms.

"A little reflection will show that these results might have been expected, for decomposition of sewage in the sewers is seldom very advanced or extensive, while the air of sewers, being very quiet, ought to contain few bacteria.

"If, now, we turn to stagnant sewage, such as might result from broken drains, or such as commonly exists in cesspools, we may reasonably expect to find more dangerous and more concentrated gases. We may even suppose that these are poisonous, and that, finding their way into human habitations, they are capable of producing sickness. There is no reason to doubt that some cases of sickness have, in fact, thus arisen, and to this extent the belief in sewer gas as the cause of disease is probably sound. In such cases, however, the sickness may

be expected to take either the form of sudden, sharp attacks, suggestive of poisoning, or else a general lowering of the vital resistance, lassitude, weakness, etc.

"While thus freely granting the possible efficiency of sewer gas as a general poison and depressant, we are very far from allowing the remaining and more popular form of the belief in sewer gas, namely, that it is capable of directly producing specific diseases, such as typhoid fever and diphtheria, which absolutely require for their genesis the introduction into the body of their own peculiar germs. The popular belief must presuppose that sewer gas is somehow a vehicle for these particular germs, which are lifted by it from the sewers or cesspools, and are conveyed with it into the alimentary or respiratory passages of the victim; and it is this part of the theory which cannot readily be allowed by the student of sanitary science.

"Another popular belief which requires careful examination is that of the efficiency of broken drains as causes of disease. From what has just been said in regard to sewer gas, the reader will surmise that the author attaches but little importance to sewers as direct sources of infectious diseases. A broken drain may, and undoubtedly often does, yield more or less of objectionable and sometimes poisonous gases, but in the present state of our knowledge of the etiology of disease it is very difficult, if not impossible, to understand how the accumulation of sewage in a cellar, or leakages of sewage from broken drains, or the escape of gases from such drains, can possibly provoke infectious disease.

"The belief in question has doubtless arisen, naturally enough, from a certain number of cases of coincidence between serious illness in the house and serious breaks in house drains. A well-known case of this kind occurred in Boston. The children of a family sickened and died of diphtheria; and inasmuch as on examination broken drains were discovered in the basement, the conclusion was immediately drawn that the drains were the cause of the disease. In many houses, however, broken drains occur, and even temporary accumulations of sewage matters, without any unfavorable consequences making their appearance. In the present state of sanitary science it is far more reasonable to suppose that the diphtheria was brought into the house by milk or other uncooked foods, or by a servant suffering a mild form of the disease, or in some other unsuspected way, than to attribute it to the occult influence of broken drains. Here, again, the gases arising from leaks and breaks may have a toxic effect, and thus lower vital resistance and increase susceptibility. To this extent, and probably to this extent only, broken drains are 'sources' of disease."—*Principles of Sanitary Science and the Public Health*, by William T. Sedgwick, Ph. D.

In order to discover any defects that might exist in the plumbing system it was considered wise to give it a thorough test. To make

the test official and satisfy the citizens, the chief plumbing inspector of Charlotte was employed to make this test, and he applied both the smoke and peppermint tests with his own apparatus and in the usual way. Only one break was discovered in the pipes and this was in the main sewer line, under the old engine bed near the front of the building, and directly under an unused room which was formerly the engine room of the building. There were two floor drains in the basement, which evidently had not been used for several months, as the water had evaporated from the traps. In the dry-storage room there is a 2-inch iron waste-pipe which had formerly been connected to a sink, but the sink was removed to another part of the building and the opening in the pipe was blocked with a piece of coal and lime. There is a wash basin in the negro women's toilet room, which was sealed in order to prevent its being used. Three of the vent pipes going to the top of the building were turned into fire flues of the chimneys at the roof line, two of them stopping at this point. Dr. King asked the plumbing inspector to recommend to me in writing the changes which he thought should be made in the plumbing, and his report is as follows:

CHARLOTTE, N. C., July 10, 1906.

"MR. W. W. LOCKE,

"DEAR SIR:—I would recommend that the following changes be made at Elizabeth College:

"All one-quarter bends, T's and sanitary T's on the ground line of soil pipe be taken out and Y's and one-eighth bends put in to take their places; also take up the urinals and floor drains in the urinal stalls in the basement and give each water-closet in the basement a separate 4-inch vent stack, each stack to be extended above the roof two feet and at least five feet from any chimney, and that all other fixtures in the basement should be revented either into the stack or be carried separately above the roof, and the line of wash trays should be separately trapped and revented. The water-closet not directly under the public toilet room to have a 4-inch vent stack and all other fixtures in this room to be revented into the 4-inch stack. The water-closet directly under the public toilet room to have the 2-inch ferrule vent carried up through the roof, and all other fixtures on this floor to be properly revented. The stacks from the public toilet rooms on the second and third floors which now go through the chimney should be taken out and carried separately through the roof, and the end closets on each floor should be taken up and continuous vents taken from the same up and through the roof. The slop sink and bath tubs on these two floors to be revented and the open 2-inch pipe in basement to be plugged with a clean-out plug; also the 4-inch vent pipe we cut off in the ground should be properly plugged with a clean-out plug and the balance of the stack that is in the chimney be taken out, as it might in some way become connected

again. I think this is the easiest and cheapest way out of it to make a good sanitary job. Hoping this will meet with your approval, I am,

"Yours truly,

(Signed) "E. HYLAND,

"City Plumbing Inspector."

"P. S.—The pipe under the old engine bed, where we found a leak, should be taken up and repaired; also the two floor drains in the boiler room should have screw plugs. E. H."

There is no doubt that the plumbing system would be more in accordance with the latest idea if the changes suggested by the chief plumbing inspector were made, but it is also true that the present system can be made tight and safe by the making of a few minor repairs and an entirely new plumbing system cannot be *more* than safe. I was surprised that more defects did not appear, as there is always danger in a building nine years old that rats under the floors or in the partitions will gnaw holes or that the building will settle and break the pipes. In order that the plumbing system may be made safe and that it may be easily tested (as it should be at least once a year at the Christmas vacation), I would suggest that the following changes be made:

1. Repair the break in the main sewer under the engine bed.
2. Remove the two floor drains and urinals in the basement and seal the pipes.
3. Cut out and remove the basin in the negro women's toilet room.
4. Effectually block the iron pipe in the dry-storage room.
5. Remove the vent pipes from the fire flues and extend them separately up through and two feet above the main roof.

Dr. Anderson came prepared to take samples of water for bacteriological analysis, and as Boston is so many hours distant by railroad from Charlotte, he kindly consented to take additional samples of the filtered city water and of the water from the tap in the cooling room at McD. Watkins' dairy, for at least a partial chemical analysis. Dr. Anderson was not allowed to send me a copy of his report, but Dr. Richard H. Lewis, Secretary of the North Carolina State Board of Health, under date of July 23d, kindly furnished me with that part of the report containing the results of the chemical and bacteriological examinations, which showed that the filtered city water is bad. This confirms the analysis made by Pennington and Browne, 213 Courtland Street, Baltimore, Md., on or about June 2 and 27, 1906. They reported the character of the water as "bad" and that the colon bacillus was present in 10 cubic centimeters of water in each instance.

Mr. C. C. Beddoes, Consulting Engineer, in his admirable report of June 22, 1906, upon the watershed and sanitary conditions of the water of the Charlotte Water Works, which was kindly furnished me by the Water Supply Committee, made some excellent recommendations. Among other things he said:

"Every large filter plant should have arrangements for the systematic bacteria examination of the water before and after filtration, especially where the water is subject to serious pollution. Such examinations need not be excessively expensive, and they will not only show the efficiency of the plant as a whole, but they may be made to show the relative efficiency of the separate filters, and will then be a substantial aid to the superintendent in always securing good effluents at a minimum cost. To allow a constant and complete control of the bacterial efficiency of filtration, the filtrate from each filter must be examined regularly, and any sudden increase in the number of bacteria should cause a suspicion of some unusual disturbance in the filter and should make the superintendent attentive to the possible causes of it.

"Without the knowledge of the bacteria in the raw water and the percentage of purification, the plant is being run by guesswork. The amount of alum to use is guessed at. Everything is left to chance, which may or may not win out. By purifying the watershed and running the purification by approved methods, there should be no difficulty in turning out a very high grade of drinking water."

I heartily agree with these recommendations and I am glad to say that the water committee, with his Honor the Mayor, are now searching for a competent bacteriologist to operate the filter plant.

Thirteen samples of water were taken for bacteriological analysis from the places indicated below, and the results of the analyses were as follows:

Sample No.	Source of Water.	Number of Bacteria Per Cubic Centimeter.	B. Coli Found in—
			Cubic Centimeters.
1	City water, Elizabeth College -----	100	1.0
2	Tap in cooling room, Watkins' dairy -----	1,800	0.1
3	Well of spring water, Watkins' dairy -----	7,000	0.1
4	Trough for milk cans, Watkins' dairy -----	9,000	0.1
5	Well at Dotger's dairy -----	100	10.0
6	Well at Culp's dairy -----	40	(?)
7	Well at Watkins' lower farm -----	12,000	0.1
8	Old mine shaft near ice plant -----	8,000	0.1
9	Clear water basin, filtration plant -----	800	1.0
10	Clear water basin, filtration plant -----	700	1.0
11	Clear water basin, filtration plant -----		1.0
12	Unfiltered city water -----	6,000	0.1
13	City water, Dr. Bland's house -----	100	10.0

CONCLUSIONS AND RECOMMENDATIONS.

As was said in the beginning, the delay in engaging experts to investigate the cause of the epidemic at Elizabeth College for seven weeks after the epidemic broke out is fatal to an absolute determination of the specific cause of that epidemic, but the conditions found at McD. Watkins' dairies, which supplied milk to the College from April 19 until the end of the term, on the watershed and at the filter plant of the public water supply and at the ice plant of the local ice company were such that it needed only the bacteriological analysis of the samples of water taken at these various places to confirm my conviction that all of these sources were badly contaminated, and any of them *might* have been the cause of the epidemic. There were several cases in the city where the people were using city water. But from the fact that the sanitary conditions in and about McD. Watkins' dairies were found to be so bad, the can and bottle washing so inefficiently done and his spring and well waters so badly infected, the evidence is certainly strong that the fever did come from using his milk. The chemical analysis of his spring water also showed that the chlorine, nitrates and nitrites were high.

There is no evidence to show that the typhoid did or could originate on the College premises. When the changes recommended in the plumbing are made, the conditions in and about Elizabeth College will be perfectly healthful. It is located in a beautiful spot on the outskirts of the city on a plot of twenty acres, and is surrounded by beautiful great oak and other trees, and would seem to be an ideal place for seclusion and quiet study. I have no suggestions or recommendations to make regarding the management of the institution, except that it would be wise to enlarge the College dairy, so as to furnish all the milk needed on the premises. The conditions about the barns can then be kept thoroughly sanitary and a watchful eye can be kept upon the dairymen to see that they are cleanly in all of their operations in handling the milk. This dairy should furnish milk enough to supply all that is needed for ice cream and it should be made on the premises.

Until after an expert bacteriologist has been employed by the city for a sufficient time to allow him to become thoroughly acquainted with the filters and to operate them in a scientific manner, and until he can assure the people that he is getting at least 98 per cent. bacterial efficiency from them and no *B. coli* in the filtered water, all drinking water used at the College should be boiled at least ten minutes, placed in closed jars and cooled for drinking purposes.

The habit of putting ice directly into milk and drinking water should be stopped, and if the ice company could be persuaded to abandon the old gold-mine shaft as a source of water supply and to freeze its ice in such a way that the process would stop before the center of the block is frozen, and the blocks be split so that the mid-

dle portion could be thrown away, much purer ice would be furnished to its patrons. I understand that this method of freezing ice is in successful operation in several cities.

Since returning to my home, Dr. Anderson and myself endeavored, at the request of his Honor the Mayor and the Water-Supply Committee, to find a suitable man to take charge of the city filter plant, and I am in hopes that by the time this report reaches your hands he will be on the spot and in charge of its operations. As soon as he has matters well in hand at the filter plant he should turn his attention to the wells and springs, and if any of them are found to be infected they should be filled up at once.

I noticed at the dairies which I visited that the milk was being chilled by spring or well water which had an initial temperature of about 58 degrees; no ice was being employed. This would indicate that the milk was not chilled to a temperature lower than about 60 degrees before being bottled. It was then put into cans or bottles and delivered to customers without ice being used to keep it cool. This means that bacteria could and probably did multiply enormously in the milk between the time it came from the cow and its delivery to the customers. The most approved method to-day, and that required in large cities, is that the milk shall be chilled immediately after milking to 45 degrees and shall be kept at that temperature until delivery to the customers. All empty milk cans and bottles should be thoroughly *sterilized* before being used again. In order that these things may be done and that pure milk may in the future be guaranteed to the citizens, all the dairies furnishing milk to the city should be brought under the supervision of the City Bacteriologist.

Respectfully submitted,

WILLIAM W. LOCKE,

Sanitary Engineer.

SOUTH FRAMINGHAM, MASS., July 26, 1906.

REPORT OF MR. D. A. TOMPKINS, CONSULTING ENGINEER.

CHARLOTTE, N. C., August 13, 1906.

TO THE HONORABLE BOARD OF WATER COMMISSIONERS.

Charlotte, N. C.

TYPHOID AT ELIZABETH.

The fever was caused by infection of some of the food in the College from some outside source. It may have been any of the food served at the College table.

Although the city water was bad, the epidemic was too acute to have resulted directly from the water. This is proven by the can-

vass of many cases of fever in the city and by the fact that day scholars who used the water, both at the College and at home, had no fever.

Mr. McD. Watkins' milk was not the cause of the epidemic at the College. If it had been, the examination of the city cases would surely have revealed typhoid along his milk route, which it did not. Also many who drank milk did not have the fever and a number who had the fever did not drink milk at all.

It was not the plumbing. Reasons why not the plumbing are given by Mr. Locke very fully in his report.

The infection in the food came from outside the College. There was no fever in the College up to the time of the outbreak and no cause inside the College seems to exist.

The only original sources of typhoid fever found are:

1. The city water.
2. Well water in or near the city.

(From one of these two sources all the infection probably originally came).

3. Milk may be a possible source of infection.

The infection of the city water comes from these causes, to-wit: (1) That the water-works plant is new and the pond was not properly cleaned out before it was filled; (2) the watershed has never been properly subjected to inspection and control; (3) the new plant has not been properly operated; (4) well water has been permitted to be used without any knowledge as to whether it is safe or not.

REMEDIES.

1. Put the city watershed under proper inspection and control.
2. Employ a bacteriologist to give his whole time to the city water supply, including all wells. When wells are found to be bad, condemn and fill them up.
3. Let the College dairy furnish all milk used by the College for drinking purposes and for ice cream.

I regard it useless for Elizabeth College to build a private water-works when the city water can be and should be made to meet every requirement. The city is in position to furnish a pure water supply because it has a plant adequate to do the work and it is in a position to buy the necessary knowledge and skill to operate this plant properly and get the results desired. Its guarantee should stand far ahead of assurances of those operating private water-supply plants. In matters of economy and health the city is in best position to furnish a supply of abundant and pure water to its citizens.

In the absence of a pure supply of water from the city, Dr. Lewis' recommendations as to a private supply is the only alternative.

When the water-works are properly operated and the infected wells are closed up and the milk supply is produced on the place, the

original causes of typhoid will be removed, and such sporadic and acute infections as that at the College will be impossible.

4. Repair plumbing as recommended by Mr. Locke, not because the plumbing could have had to do with the fever, but simply to improve it.

I regard it to be exceedingly important that city records be kept in the future, giving full facts relating to food and water supplies of each case of fever. These records should be kept by the bacteriologist in charge of the water supply. He should have full control of water-works, watershed, and all matters relating to water supply and diseases resulting from bad water, with power to act.

If the city will assure the College of the accomplishment of the above remedies, then the College can in good faith and with confidence and clear conscience assure its patrons.

D. A. TOMPKINS.

Consulting Engineer.

REPORT OF THE SECRETARY OF THE STATE BOARD OF HEALTH.

MR. CHARLES B. KING.

President Elizabeth College, Charlotte, N. C.

DEAR SIR:—In compliance with the request of Dr. Misenheimer, Physician to the College, and of Hon. D. A. Tompkins, who had been called in by him to lend his aid as a sanitary engineer in the investigation of the outbreak of typhoid fever in your institution in May last, I visited Charlotte on June 30th. I immediately entered into conference with the gentlemen named and Mr. W. W. Locke, a sanitary engineer of high standing, at present employed as general sanitary inspector of the Metropolitan Water and Sewerage Board of Massachusetts, who had been employed by the College as an expert and who had arrived a short time before. After a discussion as to the best method to pursue in making the investigation, we four made first an inspection of the College, then of the two dairies of Mr. Watkins, from whom the College had bought milk, and interviewed the purveyor of the ice cream used in the institution. After this we further discussed the problem and it was agreed that as the exigencies of my office would not permit my remaining longer on the ground the reports of Mr. Locke and of Passed Asst. Surg. J. F. Anderson, Assistant Director of the Hygienic Laboratory of the United States Public Health and Marine Hospital Service, whom General Wyman wired me he would send in response to my official request as Secretary of the State Board of Health would be submitted to me, and that I would then give my opinion as the representative of our State Board of Health.

A copy of the report of Dr. Anderson was received on the 20th inst. and one of Mr. Locke's this morning. At Mr. Locke's request I sent him the findings in the water analyses which, it was agreed, should be made in the United States Hygienic Laboratory at Washington, but was careful not to give any information as to Dr. Anderson's conclusions, so that the two reports were made independently. Both reports were very full and complete, and showed that the investigation was carefully, thoroughly and scientifically made.

After reading both reports and duly considering the data given, I agree with them in their conclusions, which you have observed are essentially identical. Expressing it more in detail, my opinion, based upon their findings and my own personal observation, is:

1. That there was nothing about the College itself that could have caused the outbreak. I am positive in my conviction that the sewerage of the building had nothing whatever to do with it. In my investigation of the epidemic of typhoid fever at the State Normal College at Greensboro, in 1899, I found that the sewer immediately beneath a battery of water-closets in the main building was broken, that the soil around it was saturated with sewage and that, too, within three feet of the opening for ventilation in the wall of a closet in which the butter supply was kept, so placed that the entering air was compelled to pass directly over it. The general—practically unanimous—opinion was that the broken sewer was the cause. I did not, however, agree in that opinion, and the final result of the investigation showed the correctness of my position. I enclose a copy of that report.

2. That the most *probable* cause was the milk of the Watkins dairy, chiefly for the reason that it was a new element that entered into the life of the school at a *time* that would come within the incubation period of typhoid fever and that the sanitary conditions of the dairy were such that the milk might be infected. But it must be borne in mind that of those who were sick probably at least six did not drink raw milk, while some who were not sick were inveterate milk drinkers, and the servants, who also drank the milk, were unaffected; and, so far as we are informed, typhoid was but little, if any, more prevalent among the numerous patrons of that large dairy than among the rest of the population. So we cannot be certain that the Watkins milk was to blame. I find myself unable to disabuse my mind of a serious suspicion of the ice cream. Practically everybody ate the ice cream except the servants. It was not eaten every day: usually only once a week. The outbreak of thirty-one cases, six the first day and all within a week, over 33 per cent. of the whole school resident in the College, or 18 per cent., admitting only seventeen to have been genuine, was in the nature of an explosion—the sudden action of a single agent not continuously at work. It is not impossible that a single can from the Dotger dairy,

the water supply of which was infected with the colon bacillus, which means fecal matter, was overlooked and not cleansed; that the bacteria therein enormously multiplied in such a congenial medium, and that when it was re-filled the milk was heavily infected and the cream from that particular can happened to be sent to Elizabeth College.

As Mr. Locke correctly says, in the light of facts ascertained by him and Dr. Anderson, the drinking water and the ice cream, as well as the milk, might have been the cause; but that, owing to the delay in beginning the investigation, it was impossible to absolutely determine the cause. I doubt if it could have been demonstrated beyond question even if the experts had been called in at once. In many epidemics it is impossible for the most highly trained specialist to write at the end of his report "Q. E. D."

But whatever the cause may have been, we all agreed that it was not anything inherent in the College itself or in its immediate surroundings.

In the way of recommendations I would endorse those made by the two gentlemen. If the public water supply is used for drinking purposes it must be sterilized by boiling. A convenient way of doing this is by means of the Forbes sterilizer, which was endorsed by the commission of distinguished scientists appointed by the Surgeon-General of the Army to investigate the great epidemic of typhoid fever among the troops during the Spanish-American War, and which has been in satisfactory use in the State Normal College since their epidemic.

A still better plan, perhaps, so far as reassuring the patrons of your school is concerned, would be either to build a cistern or dig a well on your premises, and thereby furnish a drinking supply beyond question. The former would be preferable, as wells in cities are to be deprecated ordinarily, although the objection, in your very large grounds, would hardly apply.

Respectfully yours,

RICHARD H. LEWIS, M. D.,

Secretary North Carolina Board of Health.

PUBLIC WATER SUPPLIES.

WINSTON-SALEM, N. C., January 12, 1907.

DR. RICHARD H. LEWIS,

Secretary State Board of Health, Raleigh, N. C.

DEAR SIR:—Complying with your request that I furnish a brief report on the condition of the water supplies of the various cities and towns in the State for the Biennial Report of the Board, I have the honor to report as follows:

Owing to the enactment of the law of 1903 to protect the water supplies, in which, among other important provisions, it was made compulsory on the part of the various water companies or municipalities operating water-works to have a bacteriological examination of the water made at least once a month and a chemical analysis at least every three months, it has been possible for the director of the Board's Laboratory of Hygiene and myself to keep in fairly close touch with the various water supplies and the character and quality of the water furnished.

During the past two years no very startling conditions have developed in any of the water supplies, though conditions unfavorable to the quality of the water supplied and to the public health have been brought to light in a few instances by the periodic examinations of the water that the law requires.

When such conditions have been found, prompt notice has been given to the authorities in charge, who in almost every case have promptly and energetically set about to remedy the unfavorable symptoms.

While the standard of our public water supplies has not as yet attained the degree of excellence which is desirable and for which we must continue to strive, yet it is very gratifying to note the increased interest that is being taken in the quality of public water supplies by the various municipal authorities throughout the State and the increasing readiness to co-operate in the efforts that are being made by the State Board of Health to improve and safeguard this most important factor in public-health conditions.

Another gratifying condition that may be observed is the increased appreciation of the importance of frequent inspection of the watersheds of stream supplies and sanitary surveys to supplement the periodic analyses of the water. While these inspections and surveys in many cases are entrusted to untrained and incompetent hands and perhaps yield only a minimum value, yet it indicates a growing appreciation of the effective means of safeguarding the public water supplies, and inspires the hope of the ultimate accomplishment of the plans and purposes of the Board to secure for all the cities and towns of the State a quality of public water supply that will be not only safe and good, but above suspicion.

In this connection it should be understood that the feature of public water supplies as an adjunct of municipal life is comparatively a new one in our State, the number of our towns and cities thus equipped having increased from five to fifty within the past twenty years.

During the past two years ten new water-works have been established in the State and the number is increasing constantly. In this connection it may be proper to call attention to the large number of the smaller size towns that have installed both water supplies and

sewerage systems, as indicating the great advance that has been made in general municipal sanitation in the State during recent years. The following table gives the list of cities and towns that are equipped with public water supplies and sewerage systems and the population in each, according to the United States Census of 1900. It is doubtful if any other State in the Union can present a better showing in this line of municipal sanitation when the size and population of the towns are considered:

Towns with both public water supplies and sanitary sewers.

	Population.		Population.
Asheville	14,694	New Bern.....	9,090
Charlotte	18,091	Pinehurst	42
Concord	7,910	Raleigh	13,643
Durham	6,679	Rocky Mount.....	2,937
Gastonia	4,610	Salisbury	6,277
Goldsboro	5,877	Spencer	2,500
Greensboro	10,035	Statesville	3,141
Greenville	2,565	Southern Pines.....	517
Henderson	3,746	Tarboro	2,499
Kinston	4,106	Winston-Salem	13,650
Lexington	1,234	Wilmington	20,976
Louisburg	1,178	Wilson	3,525
Morganton	1,938		

Towns with public water supplies.

	Population.		Population
Albemarle	1,382	High Point.....	4,163
Brevard	584	Hendersonville	1,917
Dunn	1,072	Oxford	2,059
Edenton	3,046	Roxboro	1,021
Elizabeth City.....	6,348	Hickory	2,535
Fayetteville	4,670	Reidsville	3,262
Graham	2,050	Wadesboro	1,546
Laurinburg	1,334	Washington	4,842
Lumberton	849	Hot Springs.....	445
Lincolnton	828	Sanford	1,044
Monroe	2,427	Waynesville	1,307
Mount Airy.....	2,680		

Respectfully submitted,

J. L. LUDLOW,

Consulting Engineer State Board of Health.

SEWAGE DISPOSAL.

STATE HOSPITAL AT MORGANTON.

MORGANTON, N. C., June 27, 1905.

DR. R. H. LEWIS,

Secretary North Carolina Board of Health.

Raleigh, N. C.

DEAR DOCTOR:—The owners, the C. A. Shuping heirs, of the farm below the Hospital, on which the sewage from this institution has been deposited, have made complaint to the Board and wish something done to relieve them of this burden. Mr. C. A. Shuping, in 1884, for a sum of money paid him, agreed to take this sewage and care for it himself. The sum was not large, but that was his lookout. The Hospital is quite willing to do what it can to help these people, who are our neighbors and good people. We wish the advice of the Board of Health in this matter. The conditions are such that I hardly see how it can be intelligently dealt with unless by a visit from the Board of Health, with its engineer. I have studied the question a little with the limited amount of information I have, but could arrive at no definite conclusion. A proposition has been made to buy the land and to make a sewage farm. Any information you are able to give the Board of Directors will be very gratefully received. The committee meets on the 6th proximo, and I would like to have something to present to them at that time in reference to this matter. I suppose later the Board could visit the institution and be able to officially advise.

With respect and esteem, I am,

Very truly yours,

P. L. MURPHY,

Superintendent.

RALEIGH, June 29, 1905.

DR. P. L. MURPHY,

Superintendent State Hospital, Morganton, N. C.

MY DEAR DOCTOR:—Yours of the 27th inst., asking the advice of the Board of Health in regard to sewage disposal by what is known as the broad irrigation method, or sewage farming, is received.

I need not say that a committee appointed by the President for the purpose will take much pleasure in making a study of the problem and advising your Board of Directors on the subject.

Where the conditions are favorable this method of sewage disposal is one of the best, unless arrangement can be made for emptying the raw sewage directly into a stream of sufficient size.

The effectiveness of the method, of course, depends upon the character of the soil and the vegetation as to the amount of work that can be accomplished. Under the most favorable circumstances as much as 75,000 gallons can be cared for per day per acre, but this diminishes down to a few thousand a day where the conditions are not favorable.

I will transmit your letter to President Thomas, who will take action in accordance therewith. It will be impossible, however, to have the work done before the 6th of July. I will notify you as soon as I hear from Dr. Thomas.

Very truly yours,

RICHARD H. LEWIS, M. D.,

Secretary.

WINSTON-SALEM, N. C., July 20, 1905.

DR. P. L. MURPHY,

Superintendent State Hospital, Morganton, N. C.

DEAR SIR:—As a result of our investigation of the proper method of disposing of the sewage of the State Hospital, made on the 17th inst., beg to advise as follows:

Situated as the institution is on high hills with creeks on either side, with a drainage area and water flow of considerable size and volume, respectively, the ultimate disposal of sewage from the institution is rather easily accomplished by being carried to and emptied into these streams, viz., the Hunting Creek on the west and Fiddler's Run Creek on the east.

A portion of the sewage is now carried through a pipe sewer to Hunting Creek on the west, and under present conditions appears to be satisfactorily disposed of. The remaining and larger portion of the sewage of the institution may be very easily carried to Fiddler's Run Creek by laying a pipe sewer from the terminus of the present sewer to the creek, a distance of about 1,600 feet, and in our judgment this would make very satisfactory disposal of the sewage, at least for the present, and probably for several years.

The plan of broad surface or subsurface irrigation of the sewage on the lands adjacent to the present terminus of the sewer, while not impracticable, yet we fear would be a cause of considerable expense and annoyance, and would not solve the problem of sewage disposal as well as conveying it and emptying it into the creek.

The State Hospital being an ideal one in so many respects, and having such beautiful grounds and buildings, as well as such successful treatment of the unfortunate of the State, as to be justly entitled to be considered the special pride of all the public institutions of the State, we feel, the sewage problem being such an important factor in the sanitary condition of the institution and of its sur-

roundings, that the sewage should be disposed of in the most modern and sanitary manner, and that on each side of the institution where the sewage is conveyed a modern purification works should be established, consisting of septic tank and contact beds for the treatment and purification of the sewage, before being turned into the running stream: and while this would be a very desirable method of procedure and one which we would like very much to see installed, yet it does not appear to be essentially necessary; hence our recommending that, for the present, at least, it be turned directly into the creeks through pipe sewers, to receive the ordinary attention to keep the sewers in successful operation and to prevent any accumulation of offensive matter at the mouth of the sewers.

Very respectfully submitted,

GEORGE G. THOMAS, M. D.,

RICHARD H. LEWIS, M. D.,

J. L. LUDLOW, C. E.,

Committee of State Board of Health.

TOWN OF SOUTHERN PINES.

SOUTHERN PINES, N. C., September 15, 1905.

DR. RICHARD H. LEWIS,

Raleigh, N. C.

MY DEAR DOCTOR:—Southern Pines, in putting in some sewerage four or five years ago, constructed a sewer bed patterned after a plan adopted by some State board of health, the principle of which is to filter the sewage through a sand bed, and as it goes down is caught in small pipes and conveyed to the branch. We have been running here two beds; by the use of a switch board, the beds can be alternately kept in service, the bed not in use being given time to dry. This scum that is spread out over the bed to dry, after drying, is raked up and a little fresh sand sprinkled on. I think the system ordinarily a good one, but it does not seem to me to be just what we need in Southern Pines. In almost every house in Southern Pines, during the winter season, there are one or more consumptives throwing off tubercle bacilli in their sputum, which ought to be burned, but instead often finds its way into the sewer, and I do not think there is any human ingenuity that could change this.

While it is true that the sunlight has a destructive power for tubercle bacilli, yet in our sewer bed it seems to me that there is abundant opportunity for them to be turned loose under conditions that might do harm. We are extending our sewerage now, and if the beds are continued they will have to be built on a larger scale, and, if my position is right, the trouble of which I speak will exist on a broader scale.

We have a fairly brisk little stream into which the sewage goes at the filter bed, and no one lives right adjacent to this stream for several miles, and I thought that it would be well for us to dispense, under existing conditions, with our filter beds and let the sewage go direct into the stream and pipe it down the branch for half a mile.

I did not know just what our rights would be in this particular, as construed by the State Board of Health, and I would thank you for an opinion in the matter. I am,

Yours truly,

K. M. FERGUSON,

Mayor.

RALEIGH, September 16, 1905.

HON. K. M. FERGUSON,

Southern Pines, N. C.

MY DEAR DOCTOR:—Replying to yours of the 15th inst., in regard to the sewage disposal for your town, I beg to suggest that you make formal application for the advice of the Engineer of the Board on this point, and I will try to arrange to have him visit Southern Pines and advise as to the best method.

You understand, of course, that this advice will be of a general character and at the expense of the Board, but if the town desires the special advice of a sanitary engineer and should see fit to employ Mr. Ludlow they would, of course, make a bargain with him. Whether you think it best to employ Mr. Ludlow or not, I do not think there is any question about the advisability of your having expert advice in the construction.

I hardly think that any real danger would lie in tuberculosis sputum discharged together with sewage. The fact that it is kept moist would prevent its dispersion into the air, and the point at which it is finally disposed of would probably be so remote that if it should dry into dust it would amount to nothing.

Hoping that you will call upon us whenever you think we can be of service, I am,

Very truly yours,

RICHARD H. LEWIS,

Secretary.

WINSTON-SALEM, N. C., November 4, 1905.

DR. RICHARD H. LEWIS,

Secretary Board of Health, Raleigh N. C.

DEAR SIR:—In pursuance of the request of Mayor Ferguson, of Southern Pines, N. C., formally transmitted through you, that I visit Southern Pines and advise the town relative to the disposal of its sewage, beg to advise as follows:

I visited Southern Pines on the 27th of October last, and found their present disposal system to consist of two rather crude sand filters, which did not appear to be well adapted to the situation, nor efficient nor satisfactory in operation, and their use has been discontinued for some time. My advice to Mayor Ferguson was that these beds be abandoned and that the sewer be extended further down the valley in which these beds are located and the sewage emptied into the branch at a point half a mile below the road crossing at the settlement known as Jimtown. This should constitute a satisfactory disposal of the sewage for a period of some years, at least, as there appear to be no interests on the stream below that could be injured to any extent by this system of disposal.

I am forwarding a copy of this report to Mayor Ferguson by this mail.

Very truly yours,

J. L. LUDLOW,
Consulting Engineer.

LEGISLATION.

(From the Bulletin of March, 1905.)

The legislation bearing on medical and health matters by the recent General Assembly consisted negatively in the defeat of a bill to charter an osteopathic society, granting a board of examiners with power to confer license, and of sundry special acts to grant license to practice medicine to individual illegal practitioners. The attitude of the Legislature toward bills of this character was very gratifying and demonstrated the solid position of our medical license law in public opinion. This satisfactory condition of affairs is attributable to no inconsiderable degree, we think, to the disposition which the State Medical Society, through its committee on legislation, supported by the Board of Medical Examiners, has always shown to do the fair thing and to avoid anything like persecution. It has been the custom of the Board of Examiners, since the right to register except upon presentation to the clerk of the court of a regular license expired, to grant upon the recommendation of the committee on legislation a special license without examination, a kind of permit to register, to those who, having failed for one reason or another to register at the proper time, would comply with the conditions of the original registration act, *e. g.*, by making oath that they were practicing medicine in this State prior to March 7, 1885. This has caused in two instances much dissatisfaction on the part of the local profession, but, having no experience with legislatures, they do not realize the importance of judicious concessions when occasion demands. We believe, however, that henceforth they will not be necessary.

The only positive legislation was important and valuable to the health interests of the people and consisted in the passage of "An Act to Establish a State Laboratory of Hygiene." Under the "Act to Protect Water Supplies" each water company was required to have made in the joint laboratory of the Agricultural Department and the Board of Health a monthly analysis of its water, and to pay therefor five dollars, but many companies failed to fully comply with the requirements, and

the income of the laboratory was in so far curtailed. Under the new act they will have to pay an annual tax of \$60, whether they neglect to have the analyses made or not, and so the income from that source will be more certain and somewhat larger than heretofore. The income from this source will be supplemented by a small appropriation from the general treasury. More was asked and the attitude of the Legislature was friendly, but the demand for money was so great that some curtailment was necessary. The following is a copy of the bill:

AN ACT TO ESTABLISH A STATE LABORATORY OF HYGIENE.

The General Assembly of North Carolina do enact:

SECTION 1. That for the better protection of the public health and to prevent the spread of communicable diseases there shall be established a State laboratory of hygiene, the same to be under the control and management of the State Board of Health.

SEC. 2. That it shall be the duty of the State Board of Health to have made in such laboratory monthly examinations of samples from all the public water supplies of the State. The board shall also cause to be made examinations of well and spring waters when in the opinion of any county superintendent of health or any registered physician there is reason to suspect such waters of being contaminated and dangerous to health. The board shall likewise have made in this laboratory examinations of sputum in cases of suspected tuberculosis, of throat exudates in cases of suspected diphtheria, of blood in cases of suspected typhoid and malarial fever, of *feces* in cases of suspected hook-worm diseases, and such other examinations as the public health may require.

SEC. 3. For the support of the said laboratory the sum of twelve hundred dollars is hereby appropriated and an annual tax of sixty dollars, payable quarterly, by each and every water company, municipal, corporate and private, selling water to the people, said tax to be collected by the Sheriff as other taxes and paid by said Sheriff directly to the treasurer of the State Board of Health, and the printing and stationery necessary for the laboratory to be furnished upon requisition upon the State Printer.

SEC. 4. Section seventeen of chapter one hundred and fifty-nine of the Laws of one thousand nine hundred and three is hereby repealed.

SEC. 5. This act shall be in force from and after its ratification.

In the General Assembly read three times, and ratified this the 4th day of March, 1905.

THE MONTHLY BULLETIN.

This publication of the Board, which is sent free to all the physicians of the State and to all others who desire it, continues to be of great usefulness, especially as a medium of communication between the Board of Health and its most valuable allies in the work of sanitation—the local health officers and the medical profession generally. In addition to the reports of the county superintendents of health of the prevailing diseases and the mortuary statistics of the larger cities and towns, articles, original and selected, bearing on the prevention of disease and the promotion of health are printed. The following are the titles of the more important articles published during the past biennial period:

Disinfection and Disinfectants; Report of Eighty Cases of Typhoid Fever at Thomasville Baptist Orphanage; The Hygienic Management of Children, with Especial Reference to Their Diet; Our Milk Supplies; Prevention of Summer Diseases of Infants; The Patent Medicine Curse; North Carolina Board of Health—Annual Report of the Secretary, May 1, 1904, to May 1, 1905; Physical Evils of Child Labor; Yellow Fever; Lest We Forget; The Physician's Paramount Duty to the Patient and Family in Pulmonary Tuberculosis; The Pure Food Problem; Compulsory Vaccination—Opinion of Attorney-General; Value of Vaccination; The Sources of Infection; Patent Medicines Again; The Question of Malaria; The Relation of the General Practitioner to the Board of Health; When and How Should the Tuberculosis Patient be Treated? The President's Address to the Conference of State and Provincial Boards of Health of North America; North Carolina Board of Health—Report of the Secretary, May 20, 1905, to May 20, 1906; Typhoid Fever; Instruction as to Tuberculosis in the Public Schools; The Home Treatment of Pulmonary Tuberculosis; Diphtheria; Meeting of the American Public Health Association.

VITAL STATISTICS.

An examination of the tables which follow shows practically no change from the statistics of the past several years. This fact is strong presumptive evidence of the accuracy of the reports.

It appears that the death rate from tuberculosis, pneumonia and malarial fever continues much larger among the negroes than among the whites, being more than 3 to 1 from consumption, quite 2 to 1 from pneumonia, and 3 to 1 from malarial fever.

For the year 1905 the deaths per thousand of population were for the three diseases, in the order given: Tuberculosis, white 1.27, colored 3.30; pneumonia, white 1.00, colored 2.02; malarial fever, white 0.15, colored 0.63. For 1906, white 1.13, colored 3.44; white 0.99, colored 2.14; white 0.19, colored 0.49, respectively.

For further details the reader is respectfully referred to the tables which follow:

TABLE I—SHOWING THE COMPARATIVE PREVALENCE OF CERTAIN DISEASES IN THE THREE PHYSICAL DIVISIONS OF THE STATE DURING 1905 AND 1906.

Eastern Division (E)—Alluvial Plain. Central Division (C)—Hilly. Western Division (W)—Mountainous. The figures under the various diseases represent in percentage the proportion of the counties reporting the presence of the disease in question to the whole number of counties sending reports for the month.

Month.	Physical Division.	Year.	Whole Number of Counties.	Number Counties Reporting.	Diphtheria.	Diarrheal Diseases.	Influenza.	Malarial Fever.	Malarial Fever, Pernicious.	Malarial Fever, Hemorrhagic.	Pneumonia.	Scarlatina.	Typhoid Fever.	Smallpox.
January.	E.	1905	36	34	14.7	0.0	26.5	8.8	0.0	5.9	23.5	5.9	6.5	73.5
		1906		26	26.9	0.0	38.4	7.7	0.0	7.7	30.7	11.6	19.2	65.4
	C.	1905	27	24	25.0	0.0	33.3	0.0	0.0	0.0	29.2	21.2	37.5	62.5
		1906		24	33.3	0.0	35.0	4.2	4.2	0.0	58.8	12.5	45.8	16.7
	W.	1905	34	33	12.1	0.0	21.2	0.0	0.0	0.0	27.3	18.2	24.2	39.7
		1906		30	16.7	0.0	26.7	0.0	0.0	0.0	43.3	3.3	26.7	6.7
February.	E.	1905	36	31	9.6	0.0	51.8	6.4	3.2	0.0	38.7	6.4	19.4	71.0
		1906		26	7.7	3.8	42.3	15.4	7.7	3.8	38.4	3.8	15.4	77.0
	C.	1905	27	25	20.0	0.0	40.0	0.0	0.0	0.0	24.0	4.0	28.0	72.0
		1906		24	29.2	0.0	21.2	12.5	8.3	4.2	45.8	4.2	45.8	25.0
	W.	1905	34	22	15.1	0.0	40.6	0.0	0.0	0.0	30.2	12.5	15.1	40.6
		1906		32	28.1	0.0	21.9	0.0	0.0	0.0	46.9	18.7	25.0	18.7
March.	E.	1905	36	31	12.9	3.2	22.7	12.9	0.0	0.0	32.2	9.6	22.7	61.3
		1906		34	5.9	0.0	8.8	5.9	0.0	0.0	26.5	11.8	8.8	58.8
	C.	1905	27	22	18.2	0.0	18.2	0.0	0.0	0.0	31.8	4.5	22.7	54.5
		1906		21	23.8	0.0	23.8	0.0	0.0	0.0	57.1	4.8	38.1	28.6
	W.	1905	34	28	7.2	0.0	21.4	0.0	0.0	0.0	21.4	3.6	7.2	25.0
		1906		30	16.7	0.0	13.3	0.0	0.0	0.0	46.7	6.7	30.0	10.0
April.	E.	1905	36	28	7.2	7.2	21.4	17.8	0.0	0.0	17.8	7.2	28.6	71.4
		1906		27	18.5	18.5	7.4	18.5	0.0	3.7	37.0	7.4	29.6	66.7
	C.	1905	27	21	16.7	0.0	4.2	4.2	0.0	0.0	16.7	0.0	29.2	58.3
		1906		22	22.7	13.6	4.5	4.5	0.0	3.7	27.3	4.5	36.4	18.2
	W.	1905	34	30	6.7	0.0	6.7	0.0	0.0	0.0	16.7	3.3	10.0	36.7
		1906		31	9.6	6.4	16.1	6.4	0.0	0.0	29.0	9.6	41.9	16.1
May.	E.	1905	36	27	0.0	44.4	0.0	14.8	0.0	3.7	7.4	7.4	37.0	44.4
		1906		28	10.7	42.8	0.0	21.4	3.6	0.0	7.2	7.2	39.3	35.7
	C.	1905	27	22	18.2	36.4	0.0	0.0	0.0	0.0	4.5	4.5	36.4	36.4
		1906		19	5.2	31.6	0.0	10.5	0.0	0.0	21.0	0.0	68.4	42.1
	W.	1905	34	31	3.2	19.4	0.0	0.0	0.0	0.0	12.9	9.6	29.0	22.7
		1906		29	13.8	41.4	3.4	3.4	0.0	0.0	20.7	10.3	55.2	10.3
June.	E.	1905	36	24	4.2	33.3	0.0	25.0	4.2	0.0	4.2	0.0	62.5	33.3
		1906		27	0.0	25.9	0.0	40.7	0.0	0.0	0.0	0.0	74.1	50.7
	C.	1905	27	21	14.3	47.6	0.0	9.5	9.5	0.0	4.8	9.5	76.2	19.0
		1906		17	17.6	11.8	5.9	29.4	0.0	0.0	0.0	0.0	94.1	23.5
	W.	1905	34	28	10.7	21.4	0.0	0.0	0.0	0.0	0.0	3.6	71.4	14.3
		1906		30	3.3	40.0	0.0	3.3	0.0	0.0	0.0	6.7	70.0	6.7

TABLE 1—CONTINUED.

Average for the Year.	Month.	Physical Division.	Year.	Whole Number of Counties.	Number Counties Reporting.	Diphtheria.	Diarrheal Diseases.	Influenza.	Malarial Fever.	Malarial Fever, Pernicious.	Malarial Fever, Hemorrhagic.	Pneumonia.	Scarlatina.	Typhoid Fever.	Smallpox.	
July.	E.	1905 1906	36	27	14.8	3.7	0.0	66.7	7.4	7.4	0.0	3.7	48.2	33.3		
				26	19.2	15.4	0.0	38.5	7.7	3.8	11.6	3.8	80.8	34.6		
				27	22	13.6	9.1	0.0	31.8	4.5	0.0	0.0	0.0	68.2	18.2	
	C.	1905 1906	27	20	10.0	0.0	0.0	40.0	10.0	0.0	10.0	15.0	90.0	10.0		
				34	30	16.7	6.7	0.0	3.3	0.0	0.0	0.0	3.3	66.7	3.3	
				30	10.0	13.3	0.0	10.3	0.0	0.0	6.7	0.0	83.3	6.7		
	W.	1905 1906	34	30	10.0	13.3	0.0	10.3	0.0	0.0	6.7	0.0	83.3	6.7		
				36	28	42.8	14.3	0.0	53.6	7.2	7.2	7.2	3.6	75.0	25.0	
				24	37.5	16.7	0.0	54.2	12.5	8.3	4.2	0.0	87.5	4.2		
	E.	1905 1906	27	24	33.3	4.2	0.0	33.3	8.3	0.0	4.2	25.0	87.5	8.3		
				20	40.0	0.0	0.0	30.0	10.0	0.0	0.0	15.0	90.0	10.0		
				34	26	42.3	3.8	0.0	11.6	0.0	0.0	7.7	7.7	69.2	7.7	
C.	1905 1906	27	29	27.6	6.9	0.0	13.8	0.0	0.0	10.3	10.3	82.7	6.9			
			36	29	5.8	3.4	0.0	62.1	17.3	17.3	0.0	6.9	75.9	24.1		
			30	53.1	6.7	0.0	50.0	10.0	13.3	16.7	6.7	70.0	0.0			
E.	1905 1906	27	22	36.4	0.0	0.0	40.9	9.1	9.1	0.0	22.7	90.9	13.6			
			22	45.4	0.0	9.1	59.1	13.6	13.6	9.1	4.5	90.9	13.6			
			34	30	53.1	0.0	3.3	6.7	0.0	0.0	0.0	23.3	83.3	3.3		
C.	1905 1906	27	28	46.4	3.6	0.0	7.2	0.0	0.0	25.0	14.3	82.2	7.2			
			34	30	50.0	0.0	3.3	10.0	3.3	0.0	20.0	20.0	66.7	0.0		
			36	28	46.4	7.2	0.0	53.6	14.3	17.8	7.2	3.6	53.6	17.8		
E.	1905 1906	27	30	63.3	0.0	0.0	60.0	10.0	20.0	0.0	0.0	53.3	3.3			
			24	66.7	0.0	0.0	22.7	8.3	0.0	4.2	29.2	79.2	8.3			
			22	63.6	0.0	9.1	18.2	0.0	4.5	22.7	4.5	77.3	9.1			
C.	1905 1906	27	32	62.5	0.0	3.1	9.4	6.2	0.0	6.2	21.9	81.2	12.5			
			30	50.0	0.0	3.3	10.0	3.3	0.0	20.0	20.0	66.7	0.0			
			36	30	50.0	0.0	10.0	26.7	3.3	10.0	16.7	3.3	50.0	26.7		
E.	1905 1906	27	26	46.1	0.0	19.2	34.6	0.0	15.4	26.9	7.7	42.3	0.0			
			24	54.2	0.0	9.1	9.1	0.0	0.0	22.7	25.1	70.8	20.8			
			20	55.0	0.0	20.0	5.0	5.0	0.0	60.0	15.0	80.0	25.0			
C.	1905 1906	27	26	42.3	0.0	7.7	0.0	0.0	0.0	26.9	30.7	65.4	7.7			
			29	37.9	0.0	6.9	0.0	0.0	0.0	31.0	10.3	44.8	3.4			
			34	26	42.3	0.0	7.7	0.0	0.0	0.0	26.9	30.7	65.4	7.7		
E.	1905 1906	27	29	37.9	0.0	6.9	0.0	0.0	0.0	31.0	10.3	44.8	3.4			
			36	29	41.4	3.4	10.3	20.7	3.4	6.9	24.1	3.4	20.7	41.4		
			27	27.0	0.0	18.5	18.5	3.7	7.4	44.4	7.4	48.2	7.4			
C.	1905 1906	27	25	40.0	0.0	12.0	0.0	0.0	0.0	48.0	8.0	48.0	20.0			
			20	45.0	0.0	25.0	5.0	0.0	0.0	70.0	10.0	35.0	35.0			
			34	32	30.2	0.0	21.9	6.2	3.1	0.0	30.2	25.0	37.5	6.2		
E.	1905 1906	27	28	21.4	0.0	17.8	0.0	0.0	0.0	42.8	17.8	39.3	0.0			
			34	32	30.2	0.0	21.9	6.2	3.1	0.0	30.2	25.0	37.5	6.2		
			28	21.4	0.0	17.8	0.0	0.0	0.0	42.8	17.8	39.3	0.0			
August.	E.	1905 1906	36	29	29.1	20.8	10.0	12.1	30.7	5.0	6.3	14.9	5.1	43.3	43.6	
				27	23.2	29.7	8.1	9.7	12.6	3.3	0.7	15.9	12.8	56.2	33.7	
				34	29	20.9	32.6	4.7	11.8	18.5	5.0	2.2	31.8	7.5	66.0	21.4
	C.	1905 1906	27	34	28.8	23.5	9.3	9.1	4.5	0.0	0.0	26.9	10.7	54.0	77.2	
				36	26	27.6	27.2	10.8	11.2	30.4	4.6	6.9	21.9	6.2	47.4	33.6
				27	20	29.0	32.6	4.7	11.8	18.5	5.0	2.2	31.8	7.5	66.0	21.4
	E.	1905 1906	27	34	28.8	23.5	9.3	9.1	4.5	0.0	0.0	26.9	10.7	54.0	77.2	
				36	26	27.6	27.2	10.8	11.2	30.4	4.6	6.9	21.9	6.2	47.4	33.6
				27	20	29.0	32.6	4.7	11.8	18.5	5.0	2.2	31.8	7.5	66.0	21.4
	C.	1905 1906	27	34	28.8	23.5	9.3	9.1	4.5	0.0	0.0	26.9	10.7	54.0	77.2	
				36	26	27.6	27.2	10.8	11.2	30.4	4.6	6.9	21.9	6.2	47.4	33.6
				27	20	29.0	32.6	4.7	11.8	18.5	5.0	2.2	31.8	7.5	66.0	21.4
E.	1905 1906	27	34	28.8	23.5	9.3	9.1	4.5	0.0	0.0	26.9	10.7	54.0	77.2		
			36	26	27.6	27.2	10.8	11.2	30.4	4.6	6.9	21.9	6.2	47.4	33.6	
			27	20	29.0	32.6	4.7	11.8	18.5	5.0	2.2	31.8	7.5	66.0	21.4	
C.	1905 1906	27	34	28.8	23.5	9.3	9.1	4.5	0.0	0.0	26.9	10.7	54.0	77.2		
			36	26	27.6	27.2	10.8	11.2	30.4	4.6	6.9	21.9	6.2	47.4	33.6	
			27	20	29.0	32.6	4.7	11.8	18.5	5.0	2.2	31.8	7.5	66.0	21.4	
E.	1905 1906	27	34	28.8	23.5	9.3	9.1	4.5	0.0	0.0	26.9	10.7	54.0	77.2		
			36	26	27.6	27.2	10.8	11.2	30.4	4.6	6.9	21.9	6.2	47.4	33.6	
			27	20	29.0	32.6	4.7	11.8	18.5	5.0	2.2	31.8	7.5	66.0	21.4	
C.	1905 1906	27	34	28.8	23.5	9.3	9.1	4.5	0.0	0.0	26.9	10.7	54.0	77.2		
			36	26	27.6	27.2	10.8	11.2	30.4	4.6	6.9	21.9	6.2	47.4	33.6	
			27	20	29.0	32.6	4.7	11.8	18.5	5.0	2.2	31.8	7.5	66.0	21.4	
E.	1905 1906	27	34	28.8	23.5	9.3	9.1	4.5	0.0	0.0	26.9	10.7	54.0	77.2		
			36	26	27.6	27.2	10.8	11.2	30.4	4.6	6.9	21.9	6.2	47.4	33.6	
			27	20	29.0	32.6	4.7	11.8	18.5	5.0	2.2	31.8	7.5	66.0	21.4	
C.	1905 1906	27	34	28.8	23.5	9.3	9.1	4.5	0.0	0.0	26.9	10.7	54.0	77.2		
			36	26	27.6	27.2	10.8	11.2	30.4	4.6	6.9	21.9	6.2	47.4	33.6	
			27	20	29.0	32.6	4.7	11.8	18.5	5.0	2.2	31.8	7.5	66.0	21.4	
E.	1905 1906	27	34	28.8	23.5	9.3	9.1	4.5	0.0	0.0	26.9	10.7	54.0	77.2		
			36	26	27.6	27.2	10.8	11.2	30.4	4.6	6.9	21.9	6.2	47.4	33.6	
			27	20	29.0	32.6	4.7	11.8	18.5	5.0	2.2	31.8	7.5	66.0	21.4	
C.	1905 1906	27	34	28.8	23.5	9.3	9.1	4.5	0.0	0.0	26.9	10.7	54.0	77.2		
			36	26	27.6	27.2	10.8	11.2	30.4	4.6	6.9	21.9	6.2	47.4	33.6	
			27	20	29.0	32.6	4.7	11.8	18.5	5.0	2.2	31.8	7.5	66.0	21.4	
E.	1905 1906	27	34	28.8	23.5	9.3	9.1	4.5	0.0	0.0	26.9	10.7	54.0	77.2		
			36	26	27.6	27.2	10.8	11.2	30.4	4.6	6.9	21.9	6.2	47.4	33.6	
			27	20	29.0	32.6	4.7	11.8	18.5	5.0	2.2	31.8	7.5	66.0	21.4	
C.	1905 1906	27	34	28.8	23.5	9.3	9.1	4.5	0.0	0.0	26.9	10.7	54.0	77.2		
			36	26	27.6	27.2	10.8	11.2	30.4	4.6	6.9	21.9	6.2	47.4	33.6	
			27	20	29.0	32.6	4.7	11.8	18.5	5.0	2.2	31.8	7.5	66.0	21.4	
E.	1905 1906	27	34	28.8	23.5	9.3	9.1	4.5	0.0	0.0	26.9	10.7	54.0	77.2		
			36	26	27.6	27.2	10.8	11.2	30.4	4.6	6.9	21.9	6.2	47.4	33.6	
			27	20	29.0	32.6	4.7	11.8	18.5	5.0	2.2	31.8	7.5	66.0	21.4	
C.	1905 1906	27	34	28.8	23.5	9.3	9.1	4.5	0.0	0.0	26.9	10.7	54.0	77.2		
			36	26	27.6	27.2	10.8	11.2	30.4	4.6	6.9	21.9	6.2	47.4	33.6	
			27	20	29.0	32.6	4.7	11.8	18.5	5.0	2.2	31.8	7.5	66.0	21.4	
E.	1905 1906	27	34	28.8	23.5	9.3	9.1	4.5	0.0	0.0	26.9	10.7	54.0	77.2		
			36	26	27.6	27.2	10.8	11.2	30.4	4.6	6.9	21.9	6.2	47.4	33.6	
			27	20	29.0	32.6	4.7	11.8	18.5	5.0	2.2	31.8	7.5	66.0	21.4	
C.	1905 1906	27	34	28.8	23.5	9.3	9.1	4.5	0.0	0.0	26.9	10.7	54.0	77.2		
			36	26	27.6	27.2	10.8	11.2	30.4	4.6	6.9	21.9	6.2	47.4	33.6	
			27	20	29.0	32.6	4.7	11.8	18.5	5.0	2.2	31.8	7.5	66.0	21.4	
E.	1905 1906	27	34	28.8	23.5	9.3	9.1	4.5	0.0	0.0	26.9	10.7	54.0	77.2		
			36	26	27.6	27.2	10.8	11.2	30.4	4.6	6.9	21.9	6.2	47.4	33.6	
			27	20	29.0	32.6	4.7	11.8	18.5	5.0	2.2	31.8	7.5	66.0	21.4	
C.	1905 1906	27	34	28.8	23.5	9.3	9.1	4.5	0.0	0.0	26.9	10.7	54.0	77.2		
			36	26	27.6	27.2	10.8	11.2	30.4	4.6	6.9	21.9	6.2	47.4	33.6	
			27	20	29.0	32.6	4.7	11.8	18.5	5.0	2.2	31.8	7.5	66.0	21.4	
E.	1905 1906	27	34	28.8	23.5	9.3	9.1	4.5	0.0	0.0	26.9	10.7	54.0	77.2		
			36	26												

TABLE II.—SHOWING THE COMPARATIVE PREVALENCE OF DISEASE DURING THE YEARS 1905 AND 1906.

Disease.	Number of Counties that Mention the Presence of each Disease each Month.											
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Number of counties that sent in reports (97 counties in the State)-----	1905-- 91 1906-- 80	88 82	81 81	82 80	80 76	73 74	79 76	78 73	81 80	84 82	80 75	86 74
Cholera (chicken) -----	1905-- 0 1906-- 0	1 0	0 0	1 0	2 1	2 0	1 1	0 1	0 2	0 2	0 1	1 0
Cholera (hog) -----	1905-- 3 1906-- 3	2 3	1 2	2 3	0 2	2 4	2 5	2 3	2 3	5 4	3 4	4 3
Diarrheal diseases-----	1905-- 0 1906-- 0	0 1	0 0	2 10	26 30	24 21	5 8	5 7	1 3	2 0	0 0	1 0
Diphtheria -----	1905-- 15 1906-- 20	13 18	10 12	8 13	6 8	7 4	12 9	31 25	41 38	49 48	39 34	32 25
Distemper (horses)-----	1905-- 0 1906-- 2	0 5	1 3	0 3	1 4	1 2	0 0	0 1	0 2	0 1	1 2	3 3
Influenza -----	1905-- 24 1906-- 24	40 22	17 12	9 8	0 1	0 1	0 0	0 1	1 0	1 2	7 3	13 15
Malarial fever-----	1905-- 3 1906-- 3	2 7	4 2	6 8	4 9	8 17	26 17	29 23	31 29	22 25	10 10	8 6
Malarial fever, hemorrhagic -----	1905-- 2 1906-- 2	0 2	0 0	0 1	0 0	1 1	2 0	2 2	7 7	5 3	3 2	2 2
Malarial fever, pernicious-----	1905-- 0 1906-- 1	1 4	0 0	0 0	0 1	3 0	3 4	4 5	7 6	8 4	1 1	2 1
Measles-----	1905-- 25 1906-- 27	34 31	42 39	38 41	33 31	20 22	14 11	10 6	8 7	11 6	9 10	13 13
Mumps -----	1905-- 2 1906-- 1	2 2	3 3	4 3	2 2	1 0	0 2	0 1	0 0	0 2	0 0	1 0
Pneumonia -----	1905-- 24 1906-- 35	28 36	23 35	14 25	7 12	2 0	0 7	5 4	0 14	5 17	17 28	29 37
Rabies (dogs) -----	1905-- 0 1906-- 1	1 0	0 1	0 0	0 0	0 0	0 0	0 0	0 0	6 0	0 0	0 0
Rotheln -----	1905-- 0 1906-- 0	0 1	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
Scarlatina -----	1905-- 13 1906-- 7	8 8	5 7	3 6	6 5	3 4	2 4	9 6	14 7	15 7	15 8	13 9
Smallpox -----	1905-- 53 1906-- 23	53 32	45 29	45 27	27 21	16 20	14 13	11 5	12 5	11 3	15 6	19 9
Staggers (horses) -----	1905-- 0 1906-- 0	0 0	0 0	0 0	0 0	0 0	0 1	0 4	0 2	0 0	0 0	0 0
Typhoid fever -----	1905-- 26 1906-- 24	18 23	14 17	18 24	27 40	51 57	48 64	62 63	67 66	60 53	49 40	29 30
Varicella -----	1905-- 0 1906-- 0	2 1	0 2	2 1	0 0	1 0	0 0	0 0	0 0	0 0	1 0	0 1
Whooping-cough -----	1905-- 22 1906-- 29	22 36	19 35	24 34	25 35	23 28	16 30	17 25	18 22	25 22	25 14	22 13

TABLE III—TABLE OF MORTALITY REPORTS FOR YEAR ENDING DECEMBER 31, 1965.

Towns and Reporters.	Races.	Deaths by Months, 1905.												Death Rate (Annual) Per 1,000, by Months.					Rate for Year.				Population.					
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	By Races.	By Towns.	By Towns.	By Towns.											
Charlotte Dr. F. O. Hawley.	W.	9	9	6	9	8	10	21	12	9	5	11	10	119	9.8	9.8	6.5	9.8	8.7	10.9	21.0	12.0	9.9	12,000				
	C.	11	13	16	11	11	12	17	16	12	7	14	13	153	18.3	21.7	26.7	18.3	3.26	0.25	5.21	0.18	0.19	5,000				
Durham Dr. N. M. Johnson. Dr. T. A. Mann.	W.	14	20	20	16	13	14	11	15	11	16	13	9	175	21.0	30.0	30.0	21.0	19.5	14.0	0.14	0.15	0.11	0.15	12,000			
	C.	17	19	14	15	9	12	12	13	8	24	6	14	163	16.8	45.6	33.6	21.6	21.0	21.0	23.0	0.16	0.18	0.25	6,000			
Elizabeth City Dr. I. Fearing. Dr. H. D. Walker.	W.	5	7	3	4	10	10	11	4	3	3	5	2	67	12.0	16.8	7.2	9.6	24.0	21.0	26.1	9.6	7.2	6.0	10.0	10,000		
	C.	6	5	12	11	3	9	11	5	11	7	7	9	99	21.0	20.0	48.0	11.0	12.0	36.0	0.41	0.20	0.12	0.21	0.21	4,000		
Fayetteville Dr. A. S. Rose.	W.	3	6	3	5	3	7	2	2	2	1	1	5	43	14.4	28.8	11.1	12.0	14.4	33.6	9.6	6.8	13.7	3.4	17.1	12.3	3,500	
	C.	6	5	11	4	7	4	5	6	7	1	3	4	63	31.3	26.1	15.7	20.9	36.6	5.20	9.23	1.31	3.33	6.4	19.2	25.2	2,500	
Goldboro Robert A. Creech, Esq., Health Officer.	W.	1	7	5	4	3	6	2	6	3	2	5	3	47	3.4	24.0	17.1	13.7	10.3	20.6	6.8	20.6	7.2	4.8	12.0	7.2	9.4	5,000
	C.	8	7	2	4	8	13	5	12	8	3	3	6	79	36.9	32.3	9.2	18.5	27.4	60.0	23.1	55.4	32.0	12.0	24.0	26.3	15.7	3,000
Greensboro John S. Michaux, Esq., City Clerk.	W.	13	7	11	8	10	19	11	18	9	9	10	8	136	25.6	13.7	21.6	15.7	19.7	37.4	27.5	30.9	10.8	12.0	9.6	13.6	19.1	10,000
	C.	9	8	10	14	18	11	7	15	18	18	14	15	150	27.9	21.0	24.0	30.0	42.0	48.0	35.0	16.8	35.0	43.2	2.43	2.33	6.30	5,000
Henderson Dr. John H. Tucker. Dr. G. A. Coggeshall.	W.	4	3	3	1	0	1	0	1	1	1	1	1	16	22.8	17.1	17.1	5.7	0.0	5.7	0.0	0.0	5.7	6.0	6.0	6.0	12.4	2,000
	C.	4	4	4	2	1	2	1	0	0	0	3	6	36	25.2	28.2	28.2	14.1	8.2	11.1	7.0	0.42	0.16	3.32	7.16	4	2,200	
Lexington J. H. Moyer, Esq., Mayor.	W.	1	2	0	1	0	4	1	0	3	1	2	0	15	4.0	8.0	0.0	4.0	0.0	16.0	4.0	0.0	12.0	1.0	8.0	0.0	5.6	3,000
	C.	0	1	0	0	0	0	0	0	2	1	1	5	5	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	40.0	20.0	20.0	8.3	600	
Marion Dr. B. S. Cheek. Dr. B. L. Ashworth.	W.	1	1	1	0	4	1	1	2	1	0	1	1	13	15.0	15.0	15.0	0.0	0.0	0.0	15.0	18.5	8.0	0.0	8.0	8.7	9.4	1,500
	C.	0	0	1	0	0	0	0	0	0	0	0	0	2	0.0	0.0	30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100	

TABLE III—CONTINUED.

Towns and Reporters.	Deaths by Months, 1905.												Death Rate (Annual) Per 1,000, by Months.												Rate for Population.				
	Races.												Grand Total.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	By Towns.	By Races.	By Towns.	By Races.
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.																	
Monroe Dr. John M. Blair.	W. 1 0 1 2 1 0 1 4 0 0 1 1 0 11 C. 2 1 1 0 1 1 0 1 0 0 0 8	19	6.5	0.0	6.0	12.0	6.0	0.0	6.0	24.0	0.0	0.0	4.8	0.0	4.4	5.4	2,500	3,500											
Oxford Dr. S. D. Booth.	W. 3 3 4 2 2 2 4 5 2 0 1 1 1 21 C. 3 3 4 2 2 2 4 5 2 0 1 1 4 34	55	28.8	28.8	19.2	38.4	0.0	9.6	28.8	19.2	0.0	8.6	8.7	8.6	15.0	19.6	1,400	2,800											
Raleigh T. P. Sale, Esq., Clerk Board of Health.	W. 13 14 21 11 16 19 10 8 12 18 8 15 165 C. 8 10 9 12 17 11 12 17 6 13 8 11 134	209	19.5	21.0	31.5	16.5	59.4	28.5	13.3	10.7	16.0	24.0	10.7	20.0	18.3	18.7	9,000	16,000											
Salem S. E. Burner, Supt. of Health.	W. 3 3 5 2 1 8 2 2 2 3 2 2 2 35 C. 1 0 0 1 2 1 0 0 0 0 0 0 6	41	10.9	10.9	18.2	7.3	3.6	29.1	7.3	7.3	10.6	0.0	7.1	7.1	10.3	10.8	3,400	3,800											
Salisbury Dr. H. T. Trantham.	W. 2 4 7 5 2 5 9 9 9 2 6 7 67 C. 5 7 3 4 5 3 3 8 4 2 2 50	117	6.2	12.3	21.5	15.4	6.2	15.4	27.7	27.7	14.6	3.2	9.7	11.2	9.9	10.6	7,400	11,000											
Southport Dr. D. I. Watson. Dr. J. A. Doshier.	W. 0 0 2 1 0 3 2 2 0 0 1 1 11 C. 1 0 1 0 1 1 3 3 1 1 3 16	27	0.0	0.0	25.7	13.3	0.0	0.0	26.7	26.7	0.0	0.0	13.3	0.0	12.2	19.3	900	1,400											
Tarboro Dr. W. J. Thigpen. Dr. S. N. Harrell.	W. 1 1 0 0 2 4 3 3 0 2 2 1 2 18 C. 0 1 0 1 2 4 3 3 1 9 4 31	49	6.0	6.0	0.0	0.0	13.3	26.7	20.0	0.0	12.0	9.6	4.8	9.6	7.2	14.0	2,500	3,500											
Wadesboro Dr. J. H. Bennett.	W. 1 1 1 1 4 2 3 4 1 1 1 2 22 C. 0 1 0 3 1 1 2 1 4 3 0 0 16	38	12.0	12.0	12.0	12.0	48.0	24.0	36.0	48.0	10.0	10.0	10.0	20.0	18.3	19.0	1,200	2,000											
Washington Dr. D. T. Tayloe. Dr. John G. Blount.	W. 7 4 8 4 2 6 1 6 6 6 3 5 58 C. 1 6 7 3 3 8 0 6 5 5 0 8 62	120	28.0	16.0	32.0	16.0	8.0	24.0	4.0	23.3	23.2	20.6	10.3	17.1	16.6	18.5	3,500	6,500											

TABLE III—CONTINUED.

Towns and Reporters.	Deaths by Months, 1905.												Death Rate (Annual) Per 1,000, by Months.												Rate for Year.		Population.	
																									By Towns.		By Races.	
	Races.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	By Races.	By Towns.													
Waynesville	W.	0	0	0	1	2	0	0	0	0	0	0	0	0	7.5	15.0	0.0	30.0	0.0	0.0	7.5	0.0	7.5	0.0	6.5	1,600	2,000	
	C.	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.5	400		
Weldon	W.	0	2	0	0	0	3	2	0	2	1	2	0	12	34	0.0	34.3	0.0	0.0	0.34	3.3	0.0	34.3	17.1	34.3	0.0	17.1	700
	C.	3	2	1	2	1	5	1	2	0	3	1	22	48	0.32	0.16	0.32	0.16	0.80	0.16	0.32	0.0	0.48	0.17	3.3	23.4	750	
Wilmington Dr. Charles T. Harper.	W.	13	16	15	8	27	22	22	29	17	18	225	526	15	6	19.2	19.2	18.0	9.6	29.4	24.0	0.24	6.18	5.19	6.20	11,000	21,000	
	C.	21	17	25	29	25	25	30	34	26	18	32	301	223	9	18	5.27	3.21	8.30	5.30	0.30	3.36	0.40	8.31	2.638	4.30	10,000	
Wilson Dr. W. S. Anderson	W.	2	4	3	1	4	2	2	6	5	4	5	40	94	6.3	6.3	12.6	9.5	3.1	12.6	6.3	6.3	19.0	15.8	12.6	15.8	10.5	3,800
	C.	3	5	3	7	3	9	3	6	5	5	3	54	12	0	20.0	12.0	28.0	12.0	36.0	12.0	24.0	20.0	20.0	12.0	8.0	18.0	3,000

TABLE IV—TABLE OF MORTALITY REPORTS FOR YEAR ENDING DECEMBER 31, 1906.

Towns and Reporters.	Races.	Deaths by Months, 1906.												Death Rate (Annual) Per 1,000, by Months.					Rate for Year.		Population.							
																			By Races.	By Towns.								
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	By Races.	By Towns.													
Charlotte Dr. F. O. Hawley.	W. C.	7 21	10 18	14 21	12 19	12 16	10 15	20 12	10 15	20 17	16 12	17 19	167 199	366 315	7.0 31.5	10.0 27.0	14.0 30.7	12.0 31.5	11.0 27.0	7.3 18.0	12.7 16.0	8.0 15.0	6.7 14.0	13.3 15.0	11.3 12.0	9.3 16.6	18,000 12,000	
Durham Dr. T. A. Mann.	W. C.	13 13	17 15	17 15	23 20	23 26	20 21	22 16	17 15	20 17	02 03	12 12	199 207	406 315	13.0 26.0	17.0 30.4	0.0 28.0	15.0 46.0	15.0 20.0	20.0 22.0	02.0 40.0	20.0 26.0	22.0 24.0	16.0 06.0	17.0 21.0	15.0 34.5	12.0 16.6	30,000 18,000
Elizabeth City Dr. H. D. Walker.	W. C.	2 9	5 10	5 8	6 13	7 8	3 10	3 9	3 10	8 12	4 11	8 11	64 115	179 88	4.0 27.0	10.0 30.0	12.0 21.0	03.0 24.0	06.0 36.0	14.0 24.0	6.0 36.0	6.0 27.0	8.0 30.0	16.0 24.0	12.0 03.0	10.7 24.0	17.9 28.7	6,000 4,000
Fayetteville Dr. A. S. Rose.	W. C.	6 2	5 4	2 3	3 6	3 7	0 5	1 6	1 5	1 3	3 2	3 4	40 48	88 54	20.6 7.2	17.1 16.8	6.9 12.0	0.0 4.8	10.3 21.6	10.3 12.0	0.0 10.0	3.4 10.0	37.7 10.0	7.0 3.0	10.3 10.3	11.4 19.2	3.5 2.5	6,000 2,500
Goldsboro Robert A. Creech, Esq., Health Officer.	W. C.	3 4	7 7	5 4	5 6	5 3	5 15	5 8	5 10	5 4	5 4	1 4	54 82	136 82	7.2 12.0	16.8 28.0	12.0 16.0	4.8 41.0	21.6 24.0	12.0 12.0	10.0 45.0	10.0 26.5	10.0 25.0	10.0 12.0	0.0 0.0	9.0 20.5	13.6 14.7	10,000 4,000
Greensboro Dr. Edmund Harrison.	W. C.	8 11	13 13	5 9	16 13	14 16	10 11	8 6	13 16	14 11	10 5	14 10	149 137	286 264	9.6 26.4	15.6 31.2	6.0 22.1	13.2 6.36	19.2 031	16.8 23.3	12.0 38.4	8.0 26.4	10.0 37.8	10.0 42.6	16.8 12.0	14.9 27.4	11.4 19.1	15,000 5,000
Henderson Dr. G. A. Coggeshall.	W. C.	1 2	1 2	0 5	2 2	1 1	2 8	1 8	5 5	0 4	2 10	2 6	17 67	84 67	6.0 10.9	6.0 9.27	0.0 31.0	6.0 46.9	6.0 26.9	12.0 41.7	0.0 40.7	30.0 39.1	6.0 41.7	30.0 26.1	0.0 52.2	8.5 20.9	19.5 23.0	2,000 2,300
Lexington J. H. Moyer, Mayor.	W. C.	3 0	2 0	2 0	3 1	3 3	5 1	7 3	3 1	3 0	0 0	0 8	33 8	41 3	12.0 0.0	8.0 0.0	16.0 20.0	02.0 20.0	12.0 60.0	20.0 20.0	0.0 0.0	28.0 0.0	10.0 0.0	0.0 0.0	0.0 13.3	11.4 9.0	3,000 3,600	
Marion Dr. B. L. Ashworth.	W. C.	1 0	1 0	0 0	3 1	4 3	2 1	1 2	1 2	1 1	2 0	1 0	16 16	16 0	8.0 0.0	0.0 0.0	0.0 24.0	8.0 32.0	0.0 16.0	16.0 0.0	8.0 0.0	16.0 0.0	0.0 0.0	10.7 0.0	10.0 7.6	1.5 4.4	1,500 1,600	
Oxford Dr. S. D. Booth.	W. C.	0 4	1 1	4 4	2 2	3 3	4 5	0 0	0 4	2 2	1 5	0 2	13 33	46 33	0.0 31.3	0.0 8.6	17.1 31.7	17.1 14.7	8.6 14.7	14.1 32.0	16.0 16.0	40.0 0.0	0.0 0.0	0.0 32.0	16.0 46.0	7.0 22.0	3.200 1.500	

TABLE IV—CONTINUED.

Towns and Reporters.	Deaths by Months, 1906.												Death Rate (Annual) Per 1,000, by Months.												Rate for Year.		Population.	
	Races.		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	By Races.	By Towns.	By Races.	By Towns.										
Raleigh T. P. Sale, Esq., Clerk Board of Health.	W. C.	16 18	11 13	12 18	16 14	19 17	16 12	18 13	15 12	16 14	24 11	13 16	188 158	346	21.3 30.9	14.7 22.3	16.0 13.7	21.3 22.3	25.3 25.4	32.3 29.6	21.3 24.4	18.7 22.3	20.6 21.6	32.0 22.3	14.7 22.6	20.9 21.6	9,000 7,000	
Salem S. H. Butler, Supt. of Health.	W. C.	5 6	6 2	6 2	4 2	4 3	3 3	3 3	3 3	3 3	4 2	2 2	41 12	53	17.6 0.0	21.0 0.0	21.2 0.0	30.0 69.0	0.0 0.0	6.0 120.0	10.6 60.0	10.6 30.0	10.6 0.0	11.4 13.9	9.5 3.0	11.4 3.0	3.400 3,800	
Salisbury Dr. H. T. Trantham.	W. C.	2 6	5 6	7 4	9 4	10 5	12 3	12 8	12 3	14 3	24 2	13 6	70 52	122	3.2 20.0	8.1 20.0	11.1 13.3	16.3 13.3	16.3 10.6	219.5 7.7	13.0 12.3	6.5 3.3	4.5 6.7	3.2 26.7	3.2 11.1	3.0 14.4	7,400 3,600	
Southport Dr. J. A. Dasher.	W. C.	0 1	0 0	2 1	1 0	1 1	1 1	2 1	1 1	2 1	1 1	0 1	9 6	15	0.0 21.0	0.0 0.0	26.7 0.0	13.3 0.0	13.3 0.0	13.3 24.0	13.3 0.0	26.7 0.0	9.5 0.0	3.2 0.0	3.2 10.0	9.5 10.0	10.0 10.0	900 600
Tarboro Dr. S. N. Howell.	W. C.	2 3	1 3	0 3	5 6	2 4	2 3	7 3	2 0	2 3	2 3	2 2	29 26	55	9.6 36.0	4.8 12.0	0.0 36.0	9.6 36.0	0.0 36.0	9.6 36.0	8.23 36.0	6.9 24.0	9.6 0.0	0.0 36.0	9.6 26.0	15.7 1.0	2.500 3,500	
Wadesboro Dr. J. H. Bennett.	W. C.	1 1	2 0	2 0	1 0	2 0	1 0	2 1	1 0	2 1	1 0	1 1	11 7	18	10.0 15.0	10.0 15.0	20.0 0.0	20.0 30.0	0.0 0.0	20.0 15.0	10.0 0.0	10.0 15.0	0.0 0.0	9.2 8.8	9.0 8.8	9.0 8.8	1,200 800	
Washington Dr. John G. Blount.	W. C.	5 3	4 3	5 6	5 6	7 7	7 6	7 7	10 6	10 6	24 10	6 4	72 112	142	13.7 12.0	13.7 40.0	17.1 20.0	24.0 24.0	17.1 16.0	24.0 24.0	21.0 21.0	20.6 20.6	30.0 16.0	18.0 40.0	20.3 23.3	20.3 25.7	7,000 3,000	
Weldon J. T. Gooch, Esq., Mayor.	W. C.	0 3	3 2	2 2	2 1	0 0	5 2	0 2	2 3	3 3	2 3	3 2	20 21	41	0.0 35.2	51.4 16.0	30.0 32.0	32.0 32.0	16.7 16.7	0.0 0.0	30.0 32.0	15.0 16.7	0.0 48.0	0.0 25.0	26.7 27.3	750 750		
Wilmington Dr. Charles T. Harper.	W. C.	22 26	15 23	16 24	22 31	22 35	22 32	23 37	23 32	23 35	18 31	31	362	612	24.0 31.2	16.4 27.6	43.7 36.0	43.7 40.0	16.7 32.3	16.7 29.0	20.2 630.0	15.0 17.4	27.2 31.7	23.4 25.7	20.4 25.7	16,000 14,000		
Wilson Dr. W. S. Anderson.	W. C.	2 4	4 2	6 7	6 3	7 4	7 5	6 2	11 7	6 3	11 3	1 4	51 61	112	6.3 12.0	12.6 8.0	18.9 24.0	18.9 24.0	6.3 16.0	19.7 20.0	6.3 8.0	34.7 44.0	9.5 28.0	3.2 16.0	13.4 20.3	16.5 3,800	3,800 3,000	

TABLE V—SHOWING CAUSES OF DEATH FOR THE YEAR ENDING DECEMBER 31, 1905.

Towns.	Races.	Population.		Annual Death Rate Per 1,000.		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping Cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrheal Diseases.	All Other Diseases.	Accident.	Suicide.	Violence.	Total Deaths.		Deaths under 5 years.	Still-born.	
		By Races.	Total.	By Races.	Total.																					
Charlotte	W.	12,000	20,000	9.9	13.6	5	0	0	0	0	1	10	9	0	9	0	9	69	7	0	0	119	272	47	18	
	C.	8,000		19.1		7	0	3	0	1	0	15	15	0	27	1	15	88	3	0	0	153		64	26	
Durham	W.	12,000	18,000	14.5	18.8	9	1	0	1	0	4	22	31	10	16	3	26	49	2	1	0	175	338	46	11	
	C.	6,000		27.2		4	0	0	0	0	1	24	31	6	7	1	27	57	54	0	0	163		51	15	
Elizabeth City	W.	6,000	10,000	11.2	16.6	3	0	3	0	0	0	0	7	4	8	3	10	28	1	0	0	67	166	30	4	
	C.	4,000		21.7		3	0	4	0	0	0	9	11	7	2	1	11	41	2	0	0	99		47	6	
Fayetteville	W.	3,500	6,000	12.3	17.7	2	0	0	0	0	0	5	7	8	5	0	4	12	0	0	0	43	106	9	0	
	C.	2,500		23.2		0	0	1	0	0	0	5	10	11	8	0	9	15	13	0	0	63		23	1	
Goldshoro	W.	5,000	8,000	9.4	15.7	1	0	0	0	0	0	2	5	4	3	0	6	24	2	0	0	47	126	13	7	
	C.	3,000		26.3		5	0	0	1	4	1	4	12	4	4	0	5	39	0	0	0	79		34	12	
Greensboro	W.	10,000	15,000	13.6	19.1	12	0	0	1	1	2	8	14	5	1	20	56	33	0	0	0	136	286	50	5	
	C.	5,000		30.0		7	1	1	0	2	1	13	28	9	12	6	13	53	2	0	0	150		54	19	
Henderson	W.	2,000	4,200	8.0	12.4	0	0	0	0	0	0	2	3	1	2	1	0	5	2	0	0	16	52	2	0	
	C.	2,200		16.4		0	0	0	0	0	0	8	4	1	2	5	1	13	2	0	0	36		0	0	
Lexington	W.	3,000	3,600	5.0	5.6	3	0	0	0	0	0	2	0	0	0	0	1	8	1	0	0	15	20	0	0	
	C.	600		8.3		0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0		0	0	
Marion	W.	1,500	1,600	8.7	9.4	4	0	0	0	0	0	0	1	2	1	0	4	1	0	0	0	13	15	0	1	
	C.	100		20.0		0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	2		0	1	
Monroe	W.	2,500	3,500	4.4	5.4	1	1	0	0	2	0	1	1	0	0	0	0	0	1	0	0	0	11	19	0	0
	C.	1,000		8.0		0	1	0	0	0	0	1	3	0	0	0	1	4	0	0	0	8		0	0	

TABLE V—CONTINUED.

Towns.	Population.		Annual Death Rate Per 1,000.		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping Cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrheal Diseases.	All Other Diseases.	Accident.	Suicide.	Violence.	Total Deaths.		Deaths under 5 years.	Still-born.	
	By Races.	Total.	By Races.	Total.																					
Oxford	W.	1,400	2,800	15.0	19.6	1	0	1	0	0	0	3	4	3	0	0	2	5	1	0	0	21	55	6	0
	C.	1,400		24.3		0	0	2	0	0	1	4	2	3	0	1	12	6	2	0	1	34	13	2	0
Raleigh	W.	9,000	16,000	18.3	18.7	3	0	0	4	3	2	17	13	17	6	3	12	76	3	2	1	299	51	6	0
	C.	7,000		19.1		2	0	0	0	2	15	20	9	6	3	5	67	4	0	0	0	134	55	13	0
Salem	W.	3,400	3,800	10.3	10.8	0	1	0	0	0	0	3	0	5	0	3	22	1	0	0	0	35	41	10	8
	C.	400		15.0		0	0	0	0	0	0	1	0	1	0	0	4	0	0	0	0	6	2	0	0
Salisbury	W.	7,400	11,000	9.0	10.6	4	0	1	2	0	0	5	9	4	9	0	11	14	6	1	1	67	117	14	0
	C.	3,600		13.9		0	0	1	0	3	0	6	6	3	7	0	7	13	4	0	0	50	11	0	0
Southport	W.	900	1,400	12.2	19.3	0	1	0	0	0	0	3	4	0	1	0	2	5	0	0	0	11	27	3	1
	C.	500		32.0		0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	16	4	0	0
Tarboro	W.	2,500	3,500	7.2	14.0	1	0	0	2	0	0	0	1	0	1	0	7	6	0	0	0	18	49	0	0
	C.	1,000		31.0		0	0	1	0	0	0	1	10	0	5	0	8	6	0	0	0	31	0	2	0
Wadesboro	W.	1,200	2,000	18.3	19.0	0	0	0	0	3	0	3	0	1	1	1	2	10	0	1	0	22	38	1	0
	C.	800		20.0		0	0	0	0	1	0	3	1	0	1	0	7	0	0	1	16	0	0	0	
Washington	W.	3,500	6,500	16.6	18.5	1	0	3	0	0	1	4	5	4	2	1	7	28	2	0	0	58	120	17	1
	C.	3,000		20.7		1	0	6	0	0	2	4	8	6	1	0	13	18	3	0	0	62	24	1	0
Waynesville	W.	1,600	2,000	6.2	6.5	1	0	0	0	1	0	2	1	0	1	0	0	3	0	1	0	10	13	3	0
	C.	400		7.5		0	0	0	0	0	0	1	0	0	0	0	2	0	0	0	0	3	0	0	0
Weldon	W.	700	1,450	17.1	23.4	0	0	0	0	0	0	1	1	0	0	0	9	1	0	0	0	12	34	1	1
	C.	750		29.3		0	0	1	0	0	0	1	3	0	0	0	3	14	0	0	0	22	6	0	0

TABLE V—CONTINUED.

Towns.	Races.		Population.		Annual Death Rate Per 1,000.		Diseases.													Total Deaths.				
	By Races.	Total.	By Races.	Total.	Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping Cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrheal Diseases.	All Other Diseases.	Accident.	Suicide.	Violence.	By Races.	By Towns.	Deaths under 5 years.	Still-born.
Wilmington	W.	11,000	20.4	25.0	10	1	7	2	2	0	15	15	9	15	19	29	85	5	9	5	225	526	70	11
	C.	10,000	30.1		4	0	18	0	0	0	10	33	12	33	31	24	126	7	0	3	301	101	47	
Wilson	W.	3,800	10.5	13.8	4	0	1	1	1	0	1	2	4	2	1	4	18	1	0	0	40	94	21	5
	C.	3,000	18.0		0	0	2	0	0	0	6	0	0	0	1	4	20	4	1	0	54	41	0	
Total, 22 towns	W.	103,900	12.8	16.7	65	5	16	14	13	9	104	132	86	96	32	159	537	39	12	7	1,256	2,813	383	79
	C.	64,300	23.1		38	3	41	2	11	9	130	212	70	111	50	163	597	40	1	9	1,197	513	148	
Grand total		168,200			103	8	57	26	24	18	234	344	156	207	82	322	1,134	79	13	16	2,813		956	227

TABLE VI—SHOWING CAUSES OF DEATH FOR THE YEAR ENDING DECEMBER 31, 1903.

Towns.	Population.		Annual Death Rate Per 1,000.		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrheal Diseases.	All Other Diseases.	Accident.	Suicide.	Violence.	Total Deaths.	
	By Races.	Total.	By Races.	Total.																	By Towns.	By Races.
Charlotte	W.	18,000	9.3	12.2	0	0	0	0	0	0	0	14	5	21	17	6	36	6	0	0	167	366
	C.	12,000	16.6		0	0	0	0	1	0	0	17	15	17	38	60	69	0	0	0	199	396
Durham	W.	12,000	16.6	22.5	0	0	0	0	6	1	17	27	15	35	38	60	69	0	0	1	199	406
	C.	6,000	31.5		0	0	0	0	14	0	0	33	8	21	48	69	0	0	0	0	207	406
Elizabeth City	W.	6,000	10.7	17.9	0	0	0	0	0	0	0	4	6	10	4	11	26	12	1	0	61	179
	C.	4,000	28.7		0	0	0	1	0	0	5	21	9	10	12	11	26	12	0	0	111	179
Fayetteville	W.	3,500	11.4	14.7	0	0	0	1	0	0	0	3	7	4	0	16	0	0	0	0	0	121
	C.	2,500	13.2		0	0	0	1	0	0	3	8	5	4	0	16	0	0	0	0	0	121
Goldshoro	W.	6,000	9.0	13.0	0	0	0	0	0	0	0	13	1	4	0	8	12	0	0	0	51	136
	C.	4,000	20.5		0	0	0	0	0	0	4	9	3	7	0	12	0	0	0	0	51	136
Greensboro	W.	10,000	14.9	19.1	0	0	0	0	0	0	12	15	9	11	1	25	41	12	1	0	119	286
	C.	5,000	27.4		0	0	0	0	1	0	16	25	10	7	2	11	23	0	0	0	137	286
Henderson	W.	2,000	8.5	19.5	0	0	0	0	0	0	0	4	1	2	0	3	7	0	0	0	17	84
	C.	2,300	29.1		1	0	0	1	1	0	6	11	4	10	2	3	7	0	0	0	67	84
Lexington	W.	3,000	11.0	11.4	0	0	0	0	0	0	2	5	1	1	0	3	17	0	0	0	33	11
	C.	600	13.3		0	0	0	0	0	0	0	2	0	0	0	1	5	0	0	0	8	11
Marion	W.	1,500	10.7	10.0	0	0	0	1	0	0	0	4	1	1	0	0	6	0	0	0	16	16
	C.	100	0.0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oxford	W.	1,750	7.6	14.4	1	0	1	0	0	0	12	2	1	0	1	0	5	0	0	0	13	46
	C.	1,500	22.0		0	0	0	0	0	0	0	10	5	0	0	0	0	0	0	0	33	46
	W.	18,000	9.3	12.2	0	0	0	0	0	0	0	14	5	21	17	6	36	6	0	0	167	366
	C.	12,000	16.6		0	0	0	0	1	0	0	17	15	17	38	60	69	0	0	0	199	396
	W.	12,000	16.6	22.5	0	0	0	0	6	1	17	27	15	35	38	60	69	0	0	0	199	406
	C.	6,000	31.5		0	0	0	0	14	0	0	33	8	21	48	69	0	0	0	0	207	406
	W.	6,000	10.7	17.9	0	0	0	0	0	0	0	4	6	10	4	11	26	12	1	0	61	179
	C.	4,000	28.7		0	0	0	1	0	0	5	21	9	10	12	11	26	12	0	0	111	179
	W.	3,500	11.4	14.7	0	0	0	1	0	0	0	3	7	4	0	16	0	0	0	0	0	121
	C.	2,500	13.2		0	0	0	1	0	0	3	8	5	4	0	16	0	0	0	0	0	121
	W.	6,000	9.0	13.0	0	0	0	0	0	0	0	13	1	4	0	8	12	0	0	0	51	136
	C.	4,000	20.5		0	0	0	0	0	0	4	9	3	7	0	12	0	0	0	0	51	136
	W.	10,000	14.9	19.1	0	0	0	0	0	0	12	15	9	11	1	25	41	12	1	0	119	286
	C.	5,000	27.4		0	0	0	0	1	0	16	25	10	7	2	11	23	0	0	0	137	286
	W.	2,000	8.5	19.5	0	0	0	0	0	0	0	4	1	2	0	3	7	0	0	0	17	84
	C.	2,300	29.1		1	0	0	1	1	0	6	11	4	10	2	3	7	0	0	0	67	84
	W.	3,000	11.0	11.4	0	0	0	0	0	0	2	5	1	1	0	3	17	0	0	0	33	11
	C.	600	13.3		0	0	0	0	0	0	0	2	0	0	0	1	5	0	0	0	8	11
	W.	1,500	10.7	10.0	0	0	0	1	0	0	0	4	1	1	0	0	6	0	0	0	16	16
	C.	100	0.0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	W.	1,750	7.6	14.4	1	0	1	0	0	0	12	2	1	0	1	0	5	0	0	0	13	46
	C.	1,500	22.0		0	0	0	0	0	0	0	10	5	0	0	0	0	0	0	0	33	46

Deaths under 5 years.

Total.

TABLE VI—CONTINUED.

Towns.	Population.		Annual Death Rate Per 1,000.		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrheal Diseases.	All Other Diseases.	Accident.	Suicide.	Violence.	Total Deaths.		Deaths under 5 years.	Still-born.	
	By Races.	Total.	By Races.	Total.																	By Races.	Total.			
Raleigh	W.	9,000	20.9	21.6	7	0	0	1	0	0	0	19	14	15	17	4	7	68	4	0	1	188	346	35	5
	C.	7,000	22.6		4	0	0	0	0	0	0	25	15	7	13	4	7	68	8	0	1	138	49	14	6
Salem	W.	3,400	11.4	13.9	1	4	0	0	1	1	1	0	0	4	0	0	0	27	1	0	0	41	53	14	0
	C.	400	36.0		0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	12		0	0
Salisbury	W.	7,400	9.5	11.1	2	0	0	0	1	0	6	11	5	3	1	20	14	7	0	0	0	70	122	24	0
	C.	3,600	14.4		1	0	1	0	0	0	6	8	7	4	0	5	17	3	0	0	0	52	11	0	0
Southport	W.	900	10.0	10.0	1	0	0	0	0	0	1	1	0	1	0	0	0	4	0	0	0	9	15	0	0
	C.	600	10.0		0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	6		0	0
Tarboro	W.	2,500	11.6	15.7	1	0	0	0	0	0	1	1	1	3	2	6	10	12	12	2	0	39	55	0	0
	C.	1,000	25.0		1	0	0	0	0	0	0	3	1	1	1	2	12	12	12	1	0	26		0	0
Wadesboro	W.	1,200	9.2	9.0	1	0	0	0	0	0	0	1	0	2	0	0	3	0	0	0	0	11	18	0	0
	C.	800	8.8		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7		0	0
Washington	W.	4,000	18.0	23.3	9	0	1	1	0	0	2	6	16	3	1	13	20	0	0	0	0	72	142	18	0
	C.	3,000	23.3		5	0	2	0	0	0	9	11	8	1	2	4	27	1	0	0	0	70		8	0
Weldon	W.	750	26.7	27.3	2	0	0	0	0	0	0	2	1	0	1	0	0	15	0	0	0	20	41	6	1
	C.	750	28.0		2	0	0	0	0	0	0	1	2	0	0	0	1	14	1	0	0	21		7	1
Wilmington	W.	16,000	15.7	20.4	11	0	11	2	3	0	27	10	7	20	13	40	98	5	4	1	252	612	83	6	
	C.	14,000	25.7		8	0	15	0	4	0	24	53	18	40	25	35	120	13	0	0	5	360	105	43	

TABLE VI—CONTINUED.

Towns.	Population.		Annual Death Rate Per 1,000.		Typhoid Fever.	Scarlet Fever.	Malarial Fever.	Diphtheria.	Whooping-cough.	Measles.	Pneumonia.	Consumption.	Brain Diseases.	Heart Diseases.	Neurotic Diseases.	Diarrheal Diseases.	All other Diseases.	Accident.	Suicide.	Violence.	Total Deaths.		Deaths under 5 years.	Still-born.	
	By Races.	Total.	By Races.	Total.																					
Wilson	3,800	6,800	13.4	16.5	7	0	1	0	1	0	0	2	3	4	7	6	4	19	0	1	0	51	112	21	1
	3,000		20.3	16.5	0	0	0	0	0	0	0	0	0	0	0	0	0	23	0	0	1	61	12	0	
Total, 20 towns	112,650	184,800	13.3	17.1	89	4	21	8	12	6	112	128	113	130	33	205	578	41	12	3,195	3164	437	81		
	72,150		23.1	17.1	61	1	36	5	28	5	159	253	91	124	52	162	626	54	1	11,669	11,669	506	139		
Grand total	184,800				150	5	57	13	40	11	271	381	204	254	85	367	1204	95	13	14,3164	---	943	220		

REPORT OF TREASURER.

Richard H. Lewis, Treasurer, in account with the North Carolina Board of Health, January 1, 1905, to December 31, 1905.

DISBURSEMENTS.

1905.

Jan.	23.	Dr. R. H. Lewis, expenses as delegate to meeting of the American Public Health Association at Havana, January 10-13.....	8	99.45
	28.	S. H. Wiley, 1 typewriter ribbon.....		1.00
Feb.	2.	C. T. Bailey, Postmaster, stamps for consumption pamphlets		50.00
	3.	Salary of Secretary and Treasurer for January...		83.33
	3.	Miss Mabel P. Massey, services as stenographer in January		19.00
	7.	Western Union Telegraph Co., telegrams in January		2.96
Mar.	2.	Miss Mabel P. Massey, services as stenographer in February		15.00
	2.	Salary of Secretary and Treasurer for February...		83.33
	9.	E. M. Uzzell, 500 postal cards for reminders for County Superintendents		5.00
April	3.	C. T. Bailey, Postmaster, deposit for postage on Bulletin		5.00
	3.	C. T. Bailey, Postmaster, order to James A. Egan, Treasurer, annual dues National Conference State and Provincial Boards of Health.....		10.08
	3.	Salary of Secretary and Treasurer for March.....		83.33
	3.	Office rent, first quarter 1905.....		15.00
	5.	C. T. Bailey, Postmaster, stamps for consumption pamphlets and general postage.....		50.00
	6.	Western Union Telegraph Co., telegrams in March.		.50
	8.	Miss Mabel P. Massey, services as stenographer in March		15.00
May	2.	Miss Mabel P. Massey, services as stenographer in April		15.00
	3.	Salary of Secretary and Treasurer for April.....		83.34
	3.	Dr. R. H. Lewis, expenses as delegate to Anti-Tuberculosis League meeting at Atlanta.....		22.25
	3.	Southern Express Co., charges on sundry packages of consumption pamphlets.....		.70
	6.	C. T. Bailey, Postmaster, stamps for consumption pamphlets		50.00
	6.	News and Observer Publishing Co., 1 copy Year-Book, 1905		2.00

May	20. C. T. Bailey, Postmaster, stamps for consumption pamphlets, as per vouchers of October 27, 1904, overlooked in Treasurer's Biennial Report..... ⁸	50.00
June	2. Miss Mabel P. Massey, services as stenographer in May	15.00
	3. Salary of Secretary and Treasurer for May.....	\$3.33
	3. Dr. W. P. Ivey, per diem and expenses annual meeting at Greensboro.....	28.10
	3. Dr. R. H. Lewis, expenses, National Conference State Boards of Health and Association for the Study and Prevention of Tuberculosis.....	50.10
	3. Dr. R. H. Lewis, annual meeting State Board of Health at Greensboro.....	13.45
	15. Dr. Henry W. Lewis, per diem and expenses, annual meeting at Greensboro.....	26.70
	15. Dr. W. O. Spencer, per diem and expenses, annual meeting at Greensboro.....	14.50
July	1. Salary Secretary and Treasurer for June.....	\$3.33
	1. Office rent, second quarter.....	15.00
	1. Miss Mabel P. Massey, services as stenographer for June	15.00
	3. Southern Express Co., charges on packages of consumption pamphlets	6.49
	6. C. T. Bailey, Postmaster, stamps for consumption pamphlets	50.00
	6. Western Union Telegraph Co., telegrams for May and June	2.63
	7. Alfred Williams & Co., sundries for office, December 10, 1904, to July, 1905.....	4.05
	8. Dr. J. A. Egan, Treasurer, post-office order for annual dues to National Conference of State and Provincial Boards of Health.....	10.08
	13. One copy Postal Guide.....	2.50
	14. W. R. Batt, Publisher, subscription to 8 copies of Sanitation, at 75 cents, for members of the Board of Health	6.00
	15. Dr. J. L. Nicholson, per diem and expenses, annual meeting at Greensboro.....	32.00
	15. S. H. Wiley, 1 typewriter ribbon.....	1.00
Aug.	3. Salary of Secretary and Treasurer for July.....	\$3.33
	3. Dr. R. H. Lewis, expenses of trip to Morganton, sewage State Hospital.....	14.75
	3. Miss Mabel P. Massey, services as stenographer for July	20.00
	4. Western Union Telegraph Co., telegrams in July..	.25

Aug.	9. Southern Express Co., charges on packages consumption pamphlets	\$.35
	11. C. T. Bailey, Postmaster, stamps for consumption pamphlets	50.00
Sept.	2. Salary of Secretary and Treasurer for August....	83.33
	2. C. T. Bailey, Postmaster, deposit for postage on Bulletin	5.00
	9. Southern Express Co., charges on packages of consumption pamphlets65
	12. Miss Mabel P. Massey, services as stenographer in August	9.00
	12. Southern Express Co., charges on packages of consumption pamphlets50
Oct.	5. Salary of Secretary and Treasurer, for September..	83.33
	5. Office rent, third quarter.....	15.00
	5. Dr. George M. Sternberg, Treasurer, annual dues Association for Study and Prevention of Tuberculosis	5.00
	5. Charity Organization Society, 1 copy Hand-Book of Tuberculosis	1.00
	5. Miss Mabel P. Massey, services as stenographer for September	15.00
	5. Dr. R. H. Lewis, expenses, annual meeting American Public Health Association, Boston, September 25-29	70.00
	11. Western Union Telegraph Co., telegrams in September90
	16. C. T. Bailey, Postmaster, stamps for pamphlets and general purposes.....	25.00
	16. Dr. J. Howell Way, per diem and expenses, annual meeting at Greensboro.....	27.25
Nov.	1. Salary of Secretary and Treasurer for October....	83.34
	1. Miss Mabel P. Massey, services as stenographer in October	15.00
	24. S. H. Wiley, 6 rolls paper for Foyer letter press....	4.25
Dec.	2. Salary of Secretary and Treasurer for November,	83.34
	5. Miss Mabel P. Massey, services as stenographer in November	15.00
	26. C. T. Bailey, Postmaster, stamps for consumption pamphlets	50.00
	30. Office rent, fourth quarter.....	15.00
	30. Drayage on Bulletin to Post-office, 12 months, at 15 cents per month.....	1.80
	30. Salary of Secretary and Treasurer for December..	83.34
	30. Miss Mabel P. Massey, services as stenographer in December	20.00

1906.

Jan.	8. Western Union Telegraph Co., telegrams to 1st inst	\$.50
	8. Charity Organization Society, subscription to charities for year.....	2.00
	23. C. T. Bailey, Postmaster, stamps for consumption pamphlets	50.00
	23. C. T. Bailey, Postmaster, deposit for postage on Bulletin	5.00
Feb.	2. Salary of Secretary and Treasurer for January...	\$3.33
	2. Miss Mabel P. Massey, services as stenographer in January	20.00
	16. Alfred Williams & Co., sundries for office from July 10, 1905.....	6.35
	17. Western Union Telegraph Co.....	.25
	21. News and Observer Publishing Co., 1 copy Year-Book, 1906	2.00
	21. E. M. Uzzell & Co., 500 postal cards for notifying Chairmen Boards County Commissioners.....	5.00
March	2. Salary of Secretary and Treasurer for February..	\$3.33
	6. Miss Mabel P. Massey, services as stenographer in February	15.00
	7. Southern Express Co., charges on packages health pamphlets75
	14. C. T. Bailey, Postmaster, stamps for consumption pamphlets	50.00
April	2. Salary of Secretary and Treasurer for March.....	\$3.33
	2. Office rent, first quarter.....	15.00
	3. Miss Mabel P. Massey, services as stenographer in March	20.00
	3. Postal Telegraph and Cable Co., telegrams.....	2.48
	5. C. T. Bailey, Postmaster, stamps for consumption pamphlets	50.00
	7. Western Union Telegraph Co., telegrams in March,	1.00
	19. E. M. Uzzell & Co., 500 postal cards, reminders to County Superintendents	5.00
May	1. Salary of Secretary and Treasurer for April.....	\$3.33
	C. T. Bailey, Postmaster, deposit for postage on Bulletin	5.00
	2. Miss Mabel P. Massey, services as stenographer for April	15.00
	6. Western Union Telegraph Co., telegrams in April..	.52
June	9. Salary of Secretary and Treasurer for May.....	\$3.33
	9. Dr. R. H. Lewis, expenses as delegate to National Conference State and Provincial Boards of Health at Washington and annual meeting of the Board of Health at Charlotte.....	\$7.25

June	11.	Dr. W. P. Ivey, per diem and expenses, annual meeting Board of Health at Charlotte.....	\$ 23.70
	11.	Dr. J. Howell Way, per diem and expenses, annual meeting at Charlotte.....	31.95
	11.	Dr. Francis Duffy, per diem and expenses, inspection of State Hospital at Goldsboro, November, 1904	8.80
	11.	Dr. Thomas E. Anderson, per diem and expenses, annual meeting at Charlotte.....	22.50
	12.	Miss Mabel P. Massey, services as stenographer in May	16.60
	18.	A. Williams & Co., $\frac{1}{2}$ doz. pads (50 cents), 1 type-writer ribbon (\$1).....	1.50
	19.	Dr. W. O. Spencer, per diem and expenses, annual meeting at Charlotte.....	18.52
	22.	C. T. Bailey, Postmaster, stamps for consumption pamphlets	50.00
	23.	Dr. George G. Thomas, per diem and expenses, annual meeting at Charlotte.....	12.00
July	2.	Salary of Secretary and Treasurer for June.....	83.33
	2.	Office rent, second quarter.....	15.00
	9.	Western Union Telegraph Co., telegrams in June...	2.98
	9.	Miss Mabel P. Massey, services as stenographer in June, less one day.....	33.50
	31.	C. T. Bailey, Postmaster, stamps for consumption pamphlets	50.00
Aug.	2.	Salary of Secretary and Treasurer for July.....	83.33
	4.	Miss Mabel P. Massey, salary as stenographer for July	35.00
	8.	Postal Telegraph and Cable Co., telegrams in July...	.77
	9.	Southern Express Co., charges on packages of consumption pamphlets	1.80
Sept.	6.	Salary of Secretary and Treasurer for August....	83.34
	6.	Dr. R. H. Lewis, expenses, official visits to Hillsboro, Charlotte and Morganton.....	22.80
	7.	Stone & Barringer, 1 typewriter ribbon.....	1.00
	12.	Miss Mabel P. Massey, services as stenographer in August	35.00
	13.	W. G. Briggs, Postmaster, stamps for health pamphlets and general postage.....	50.00
	28.	Dr. Thomas E. Anderson, per diem and expenses, inspection State institutions at Greensboro.....	17.00
Oct.	2.	Salary of Secretary and Treasurer for September..	83.34
	2.	Office rent, third quarter.....	15.00

Oct.	2. W. G. Briggs, Postmaster, stamps for consumption pamphlets	\$ 50.00
	3. J. L. Ludlow, per diem and expenses, annual meetings, 1905-6, and official visit to Morganton.....	44.35
	6. Miss Mabel P. Massey, services as stenographer in September	55.00
	8. Dr. George G. Thomas, per diem and expenses, inspection State institutions at Morganton.....	24.50
	16. Western Union Telegraph Co., telegrams in September	1.26
	26. Postal Cable Telegraph Co., telegrams in September.	.62
Nov.	31. T. F. Brockwell, sharpening knives of mailing machine25
	9. Salary of Secretary and Treasurer for October....	83.34
	9. A. Williams & Co., office supplies to 1st inst.....	6.27
	12. Southern Express Co., charges on packages of consumption pamphlets	1.10
	14. Dr. R. H. Lewis, expenses lecture, Guilford College, 10th inst	8.80
Dec.	14. Miss Mabel P. Massey, salary as stenographer in October	35.00
	13. Salary of Secretary and Treasurer for November..	83.34
	13. Dr. R. H. Lewis, expenses, delegate to annual meeting American Public Health Association, City of Mexico	150.00
	14. Miss Mabel P. Massey, services as stenographer in November	35.00
	15. Dr. W. O. Spencer, expenses and per diem, inspection State institutions at Greensboro.....	7.30
	15. Dr. W. P. Ivey, expenses and per diem, inspection State institutions at Raleigh.....	36.95
	17. W. G. Briggs, Postmaster, stamps for health pamphlets and general purposes.....	50.00
	17. Postal Cable Telegraph Co., telegrams in November.	.62
	18. W. G. Briggs, Postmaster, deposit for postage on Bulletin	5.00
	20. Miss Mabel P. Massey, salary as stenographer in December	35.00
	20. Dr. George M. Sternberg, Treasurer, annual dues, National Association for the Study and Prevention of Tuberculosis.....	5.00
	22. S. H. Wiley, 1 Foyer teller (\$2.25), 1 typewriter ribbon (\$1)	3.25
	31. Salary of Secretary and Treasurer for December..	83.34

Dec.	31. Office rent, fourth quarter.....	\$ 15.00
	31. G. M. Hardin, carriage hire, two days, annual inspection State institutions in Raleigh.....	9.50
	31. Drayage on Bulletin to post-office, 12 months, at 15 cents per month.....	1.80
	31. Balance on hand, December 31, 1906.....	90.75

RECEIPTS.

		\$4,526.58
	Balance on hand January 1, 1905.....	\$ 526.58
	Annual appropriation, 1905.....	2,000.00
	Annual appropriation, 1906.....	2,000.00
		\$4,526.58

Richard H. Lewis, Treasurer, in account with the State Laboratory of Hygiene, November 9, 1903, to December 31, 1906.

DISBURSEMENTS.

1903.		
Nov.	9. Dr. G. McCarthy, stamps.....	\$ 1.00
	9. Dr. G. McCarthy, salary as Biologist.....	187.50
	21. Whitall, Tatum & Co., laboratory supplies.....	21.92
Dec.	15. J. E. Mitchell, 1 doz. cases for water bottles.....	4.50
1904.		
Jan.	11. Dr. G. McCarthy, salary as Biologist.....	187.50
	28. Whitall, Tatum & Co., laboratory supplies.....	3.27
	28. Dr. G. McCarthy, sundries.....	9.09
April	9. Dr. G. McCarthy, sundries.....	19.05
	14. Dr. G. McCarthy, salary as Biologist.....	187.50
May	4. Southern Express Co., expressage on water samples.....	8.95
June	12. Dr. G. McCarthy, stamps.....	5.00
	16. Dr. G. McCarthy, salary as Biologist.....	62.50
	16. Southern Express Co., expressage on water samples.....	7.35
July	2. Southern Express Co., expressage on water samples.....	5.30
	20. Dr. G. McCarthy, salary as Biologist.....	125.00
Aug	3. Southern Express Co., expressage on water samples.....	11.40
	4. Miss Mary Scott Birdsong, salary as stenographer.....	5.00
Sept.	1. Southern Express Co., expressage on water samples.....	9.80
	3. Dr. G. McCarthy, stamps and chemicals.....	7.65
	3. Dr. G. McCarthy, subscriptions to biological publications	6.10
	7. Miss Mary Scott Birdsong, salary as stenographer.....	5.00
	14. Eimer & Amend, laboratory supplies.....	14.55
	30. Dr. G. McCarthy, salary as Biologist.....	187.50

Oct.	5. Miss Mary Scott Birdson, salary as stenographer, \$	5.00
	14. Southern Express Co., expressage on water samples,	8.95
Nov.	10. Dr. G. McCarthy, stamps.....	6.50
	16. Miss Mary Scott Birdsong, salary as stenographer,	5.00
	11. Southern Express Co., expressage on water samples,	8.55
	12. Lemeck & Buechner, laboratory supplies.....	6.10
Dec.	7. Miss Mary Scott Birdsong, salary as stenographer,	5.00
	10. Dr. J. M. Pickel, chemical work for laboratory....	50.40
	13. Southern Express Co., expressage on water samples,	4.95
	20. Dr. G. McCarthy, salary as Biologist.....	187.50
	22. United Industrial Fiber Co., water carriers.....	14.85
	22. Eimer & Amend, laboratory supplies.....	13.82
	22. W. H. King Co., laboratory supplies.....	3.00
	23. Dr. G. McCarthy, salary as Biologist.....	125.00
	30. Miss Mary Scott Birdsong, salary as stenographer,	5.00
1905.		
Feb.	21. Southern Express Co., expressage on water samples,	20.25
	9. Miss Mary Scott Birdsong, salary as stenographer,	5.00
Mar.	18. Southern Express Co., expressage on water samples,	7.60
	20. Dr. G. McCarthy, sundries.....	5.72
	20. Lemeck & Buechner, laboratory supplies.....	7.50
April	7. Miss Mary Scott Birdsong, salary as stenographer,	7.50
	10. Southern Express Co., expressage on water samples,	7.95
May	3. Southern Express Co., expressage on water samples,	12.35
	5. Miss Mary Scott Birdsong, salary as stenographer,	5.00
June	2. Miss Mary Scott Birdsong, salary as stenographer,	5.00
	6. Southern Express Co., expressage on water samples,	9.10
	15. Dr. G. McCarthy, salary as Biologist.....	416.67
July	3. Southern Express Co., expressage on water samples,	9.80
	7. B. F. Dawson, sheriff's commission.....	1.59
	13. Seaboard Air Line, freight on supplies.....	2.32
	15. Dr. G. McCarthy, sundries.....	12.03
	15. W. H. King Co., laboratory supplies.....	22.02
	31. Miss Sophie M. Grimes, salary as stenographer....	12.00
Aug.	1. C. W. Miller, salary as assistant.....	75.00
	4. Spence Lens Co., laboratory apparatus.....	49.88
	4. Arthur H. Thomas, laboratory supplies.....	87.08
	9. Southern Express Co., expressage on water samples,	14.90
	9. Eimer & Amend, chemical apparatus.....	25.89
	9. Lemeck & Buechner, laboratory supplies.....	13.49
	9. Arthur H. Thomas, laboratory supplies.....	6.13
	31. C. W. Miller, salary as assistant.....	50.00
Sept.	15. Miss Sophie M. Grimes, salary as stenographer....	10.00
Oct.	3. Carolina Wood Workers, 6 doz. water boxes.....	25.20
	5. Miss Sophie M. Grimes, salary as stenographer....	10.00
	6. Southern Express Co., expressage on water samples,	25.30

Oct.	24.	Dr. G. McCarthy, salary of Dr. Pickel and sundries, \$	54.67
	24.	Dr. G. McCarthy, salary as Biologist.....	300.00
Nov.	2.	W. H. McIntire, salary as assistant.....	50.00
	2.	Miss Sophie M. Grimes, salary as stenographer....	10.00
	4.	Southern Express Co., expressage on water samples,	10.35
Dec.	2.	W. H. McIntire, salary as assistant.....	50.00
	2.	Miss Sophie M. Grimes, salary as stenographer....	10.00
	9.	Dr. G. McCarthy, sundries.....	4.84
	9.	Eimer & Amend, laboratory supplies.....	30.56
	9.	Arthur H. Thomas, laboratory supplies.....	17.51
	9.	W. H. King Co., laboratory supplies.....	3.50
	15.	Southern Express Co., expressage on water samples,	11.75
	23.	Dr. G. McCarthy, salary as Biologist.....	300.00
	23.	Miss Sophie M. Grimes, salary as stenographer....	10.00
	23.	W. H. McIntire, salary as assistant.....	50.00
1906.			
Jan.	16.	Dr. G. McCarthy, stamps.....	5.98
	23.	Southern Express Co., expressage on water samples	12.25
Feb.	1.	Miss Sophie M. Grimes, salary as stenographer....	10.00
	1.	W. H. McIntire, salary as assistant.....	55.00
	1.	Edward Jones, wages.....	5.00
	1.	Southern Express Co., expressage on water samples,	12.10
Mar.	1.	Miss Sophie M. Grimes, salary as stenographer....	10.00
	1.	W. H. McIntire, salary as assistant.....	55.00
	7.	Southern Express Co., expressage on water samples,	12.60
	13.	Dr. G. McCarthy, sundries.....	14.89
	13.	Dr. G. McCarthy, salary as Biologist.....	300.00
	29.	Eimer & Amend, laboratory supplies.....	46.51
	29.	Arthur H. Thomas, laboratory supplies.....	14.52
April	2.	Miss Sophie M. Grimes, salary as stenographer....	10.00
	2.	W. H. McIntire, salary as assistant.....	55.00
	4.	Southern Express Co., expressage on water samples,	12.10
	19.	Dr. G. McCarthy, salary as Biologist.....	25.00
	30.	W. H. McIntire, salary as assistant.....	60.00
	30.	Miss Sophie M. Grimes, salary as stenographer....	12.50
May	4.	W. H. King Co., laboratory supplies.....	6.06
	4.	Dr. G. McCarthy, sundries.....	17.93
	15.	Southern Express Co., expressage on water samples,	12.80
	15.	Arthur H. Thomas, laboratory supplies.....	13.97
June	2.	Miss Sophie M. Grimes, salary as stenographer....	12.50
	2.	W. H. McIntire, salary as assistant.....	60.00
	12.	Southern Express Co., expressage on water samples,	10.95
	22.	Dr. G. McCarthy, sundries.....	18.70
	22.	Dr. G. McCarthy, salary as Biologist.....	300.00
	22.	Lemeck & Buechner, laboratory supplies.....	11.59

June	23. W. H. McIntire, salary as assistant.....	\$ 60.00
	23. Miss Sophie M. Grimes, salary as stenographer....	12.50
July	2. Southern Express Co., expressage on water samples,	12.35
	17. W. H. King Co., laboratory supplies.....	5.60
Aug.	1. W. H. McIntire, salary as assistant.....	60.00
	1. Miss Sophie M. Grimes, salary as stenographer....	6.25
	1. Arthur H. Thomas Co., laboratory supplies.....	13.18
	9. Southern Express Co., expressage on water samples,	14.20
Sept.	5. W. H. McIntire, salary as assistant.....	60.00
	8. Southern Express Co., expressage on water samples,	17.25
	8. Miss Sophie M. Grimes, salary as stenographer....	12.50
	14. Dr. G. McCarthy, sundries.....	23.28
	29. W. H. McIntire, salary as assistant.....	60.00
Oct.	1. Dr. G. McCarthy, sundries.....	18.00
	4. Eimer & Amend, laboratory supplies.....	21.19
	4. John Wiley & Son, books.....	13.75
	4. K. H. Hews & Co., Inc., laboratory supplies.....	3.60
	4. Whitall, Tatum & Co., bottles for laboratory.....	12.30
	5. Dr. G. McCarthy, salary as Biologist.....	300.00
Nov.	9. W. H. McIntire, salary as assistant.....	60.00
	9. Miss Edith Dixon, salary as stenographer.....	12.50
	9. Dr. G. McCarthy, sundries.....	20.40
	12. Southern Express Co., expressage on water samples,	29.20
Dec.	27. Dr. G. McCarthy, sundries.....	22.56
	27. Dr. G. McCarthy, money advanced to pay assistant and stenographer in November and December....	145.00
	27. Dr. G. McCarthy, salary as Biologist.....	300.00
	31. Lemeck & Buechner, books.....	8.80
	31. Journal of Infectious Diseases.....	10.00
	31. W. H. King, chemicals.....	13.51
	31. Arthur H. Thomas Co., laboratory supplies.....	27.95
	31. Eimer & Amend, laboratory supplies.....	20.81
	31. A. Williams & Co., office supplies.....	19.15
		<hr/>
		\$6,015.38
Balance on hand.....		835.16
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		\$6,850.54

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